



# The Structure, Role and Mandate of Civil Protection in Disaster Risk Reduction for South Eastern Europe

*South Eastern Europe Disaster Risk Mitigation  
and Adaptation Programme*



THE WORLD BANK



International Strategy for  
Disaster Reduction



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## **Preface**

The review presented here was undertaken within the scope of the South Eastern Europe Disaster Risk Mitigation and Adaptation Programme (SEEDRMAP), which is a collaborative initiative developed by the World Bank and the United Nations International Strategy for Disaster Reduction Secretariat (UNISDR) in cooperation with a number of international and regional partners. Among them: the European Commission (EC); Council of Europe (European and Mediterranean Major Hazards Agreement); Regional Coordination Council for South Eastern Europe (RCC SEE); Disaster Preparedness and Prevention Initiative for South Eastern Europe (DPPI SEE); and United Nations partners including the World Meteorological Organization (WMO), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and the United Nations Development Programme (UNDP).

The objective of SEEDRMAP is to reduce the vulnerability of the countries of South Eastern Europe (SEE) to the risk of disasters. It addresses the loss of life, property and economic productivity caused by weather extremes and other natural hazards in the context of the implementation of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters. To that end, SEEDRMAP has three focus areas: (i) hydrometeorological forecasting, data sharing and early warning; (ii) coordination of disaster mitigation, preparedness and response; and (iii) financing of disaster losses, reconstruction and recovery, and of disaster risk transfer (disaster insurance).

This document was undertaken in the context of the second focus area of SEEDRMAP, in 2008, and reviews the coordination of disaster mitigation, preparedness and response among the Civil Protection actors of SEE, identifying needs both with respect to staff capacity and training and in terms of disaster risk reduction facilities, with a focus on preparedness and response.

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## Abbreviations and Acronyms

ACP	Albanian Civil Protection
ALADIN	Aire Limitée Adaptation dynamique Développement International (High Resolution Limited Area meteorological forecasting model)
BH	Bosnia and Herzegovina
CBRN	Chemical, Biological, Radiological, and Nuclear
CECIS	Common Emergency Communication and Information System
CIMA	Centro Internazionale in Monitoraggio Ambientale
CMC	Crisis Management Centre
CMS	Crisis Management System
CMEP SEE	Civil-Military Emergency Planning Council for South East Europe
CMEP	Civil Military Emergency Preparedness
CNRRS	National Centre for Seismic Risk Reduction
COS (OT)	COnsorzio per lo Sviluppo dei distretti industriali per le Osservazioni della Terra
CP	Civil Protection
CPC	Civil Protection Committee
CRED	Centre for Research on the Epidemiology of Disasters
D.L.	Decreto legislativo (Legislative Decree)
DEMA	Danish Emergency Management Agency
DG ENV	Directorate General responsible for ENVironment
DMTP	Disaster Management Training Program
DPPI SEE	Disaster Preparedness and Prevention Initiative for South Eastern Europe
DWD	Deutsche Wetter Dienst
EADRCC	Euro-Atlantic Disaster Response Coordination Centre
EC	European Commission
ECHO	European Commission Humanitarian Aid department
ECMWF	European Centre for Medium-Range Weather Forecasts
EM-DAT	Emergency Events Database
EMERCOM	Ministry of the Russian Federation for the Affairs of Civil Defence, Emergency Situations and Disaster Relief
ERCS	Emergency Response Core Service
EU	European Union
EUMETNET	Network of European Meteorological Services
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUR-OPA	European and Mediterranean Major Hazards Agreement
FBH	Federation of Bosnia and Herzegovina
GO	Government Ordinance
GIS	Geographical Information System
GMES	Global Monitoring Environment and Security initiative
GOEWDS	Group Of Experts on Warning and Detection Systems
GPRS	General Packet Radio Service
HRIT	High Rate Information Transmission
LRIT	Low Rate Information Transmission
ICI	National Institute for R&D in Informatics
IGSU	National Committee for Emergency Situations General GIES: Inspectorate for Emergency Situations
IMC	Inter-Ministerial Committee
ISPIF	Studies and Designing Institute for Land Improvement
MEDEX	MEDiterranean Experiment
MES	Ministry of Emergency Situations

MIC	Monitoring and Information Centre
MKS	Medvedev-Karnik-Sponheuer
MOEW	Ministry of Environment and Water
MoH	Ministry of Health
MPW	Ministry of Regional Development and Public Works
MSPDA	Ministry of State Policy for Disasters and Accidents
MU	Mobile Unit
NAM	National Hydrological and National Meteorological Institute
NCEP	National Civil Emergency Plan
NDAST	National Disaster Archive System of Turkey
NEOC	National Emergency Operation Centre
NFS	National Forest Service
NIMH	National Institute of Meteorology and Hydrology
NGO	Non-Governmental Organization
NPRD	National Protection and Rescue Directorate
NSPCEM	National Scientific and Practical Centre for Preventive Medicine
OPERA	Operational Eo-based RAInfall-runoff forecast
OSCE	Organisation for Security and Cooperation in Europe
PER	Plan d'exposition aux risqué
PROCIV	Civil Protection Working Party
PRS	Protection and Rescue Sector
PSTN	Public Switched Telephone Network
RCA-BH	Red Cross Association of Bosnia and Herzegovina
RCC	Regional Cooperation Council
RHMSS	Hydrometeorological Service of the Republic of Serbia
RIPHP	Regional Inspectorates for Public Health Protection
RNBC	Radiological, Nuclear, Biological and Chemical
RODOS	Realtime Online Decision Support System
SCEPC	Senior Civil Emergency Planning Committee
SEDM	Southeast European Defence Ministerial
SEE	South Eastern Europe
SEEDRMAP	South Eastern Europe Disaster Risk Mitigation and Adaptation Programme
SEEDRMI	South Eastern Europe Disaster Risk Management Initiative
SEESIM	South Eastern Europe Simulation
SEMA	Swedish Emergency Management Agency
SFRY	Socialist Federal Republic of Yugoslavia
SHMS	State Hydrometeorological Service
SRSA	Swedish Rescue Services Agency
STESTA	Secure Trans European Services for Telematics between Administrations
TACOM	Terrorist Act Consequences Management Training
TESIS	Advanced Technologies and Systems for the Knowledge-based Information Society
TSMS	Turkish State Meteorological Service
UNCT	United Nations Country Team
UNDP	United Nations Development Programme
UNISDR	United Nations International Strategy for Disaster Reduction
USSR	Union of Soviet Socialist Republics
UXO	Unexploded Ordnances
WMO	World Meteorological Organization



## Executive Summary

Disaster risk reduction is a broad and cross-cutting issue which requires political commitment and public understanding to achieve. It aims to lessen the vulnerability of people and property to the adverse impact of hazards.

Realizing this objective will require systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, wise management of land and the environment, the establishment of solid early-warning systems and improved preparedness for adverse events. It implies the involvement of different actors, ranging from community-based organisations to national governmental agencies and regional and international bodies.

Civil Protection actors contribute to this broad agenda through their traditional focus on disaster preparedness and response, and also by stimulating the engagement of governments to address appropriate disaster risk reduction policies, and/or through participation in National Platforms for disaster risk reduction<sup>1</sup>. Sometimes they participate in the National Platforms as coordinators<sup>2</sup>, thereby facilitating the actions of Platform members.

It is from the perspective of Civil Protection's customary focus on preparedness and response and its involvement in the broader disaster risk reduction agenda that this report has been addressed. It represents an opportunity to enhance capabilities and information sharing through a review of the strengths, needs and opportunities for development of the Civil Protection sectors of South Eastern Europe.

## Objectives

This report aims to review the capabilities and needs of the Civil Protection sectors of South Eastern Europe (SEE) countries and of three EU case studies, namely Italy, Slovenia and Sweden.

The report assesses the Civil Protection structures of each country, including the level of preparedness and ability to effectively monitor hazards and evaluate potential vulnerabilities. It briefly examines the nature of the risks each country faces, from both natural and technological hazards, and examines in detail the existing Civil Protection procedures at a legislative and administrative level (national, regional and municipal), including an assessment of early-warning systems and disaster management capacities.

## Methodology

The information this report contains is based largely on that provided by the Civil Protection sectors of each country reviewed and is the result of responses provided to a preliminary questionnaire sent to each national administration<sup>3</sup>.

Each country was visited in order to discuss with relevant officials the responses to the questionnaires and to acquire any supporting data. The questions posed, and the subsequent discussions during the visits, covered:

- the legislative aspects of countries, including potential developments in the near future;
- a description of the Civil Protection structures from the point of view of the organisation of command and control;
- the personnel involved in Civil Protection ordinarily and in times of emergency;

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1 A National Platform for disaster risk reduction can be defined as a nationally owned and led forum or committee of multi-stakeholders. It serves as an advocate of disaster risk reduction at different levels and provides coordination, analysis and advice on areas of priority requiring concerted action through a coordinated and participatory process. A National Platform for disaster risk reduction should be the coordination mechanism for mainstreaming disaster risk reduction into development policies, planning and programmes in line with the implementation of the HFA. It should aim to contribute to the establishment and the development of a comprehensive national disaster risk reduction system, as appropriate to each country.

2 In Europe examples are among others: Italy, Sweden and Spain.

3 The questionnaire is included in ANNEX 1

- the estimated annual costs and the financial instruments supporting Civil Protection both at central and local level;
- the connection between Civil Protection organisations, research agencies and private companies;
- international cooperation;
- the level of professional training and diffusion of Civil Protection concepts within the education sector;
- the frequency and efficiency of simulation exercises;
- the interaction with the EU Mechanism for Civil Protection and international agencies.

The results are documented in the following chapters.

Responses from the Civil Protection sectors of Italy, Slovenia and Sweden are presented and analysed in Chapter 2, while those of the SEE countries are presented in Chapter 3. To promote clarity and ease of comparison between the different countries, the following standardized format has been adopted for each report:

Country reports start with an assessment of national populations' perceptions of Civil Protection, followed by an overview of each country's demographic characteristics and administrative divisions. The main body of law covering Civil Protection is then outlined, followed by a summary of Civil Protection structures and an examination of how policy is articulated at local level.

The type of hazard each country faces is also outlined, and the level of preparedness of Civil Protection structures is assessed along with the effectiveness of early-warning systems and response capacities. Country reports also include summaries of the quantities of human and financial resources dedicated to the reduction of risk and the impacts of disasters caused by natural and technological hazards.

In Chapter 4 the progress that Civil Protection sectors of SEE countries are making in addressing disaster risk reduction is examined and a series of general recommendations made on how to promote alignment with Hyogo Framework objectives and enhance emergency response capabilities.

## **Findings**

The report finds that national policy frameworks addressing elements of disaster prevention, preparedness and response and the development of Civil Protection capacities are present in all countries. However, variation occurs in the way in which these policy frameworks are addressed in countries such as Albania, Bosnia and Herzegovina, and Moldova, which tend to emphasize development at the central level with less emphasis on the decentralization of competences to local levels compared with the other countries in the region.

Financial and human resources for Civil Protection are in short supply in most SEE countries and whereas the proportions of GDP allocated to Civil Protection sectors are comparable with EU levels the actual figures involved are small. Similarly, when measured as a proportion of the total active population the numbers of people involved in Civil Protection are not dissimilar to EU levels, although again the actual numbers are small.

The report finds that discrepancies occasionally exist between political commitment, as manifest in government policy, and the practical application of that policy. Consequently, whereas the need to improve prevention, preparedness and response is often incorporated at policy level, at an operational level this commitment often does not translate into concrete action. Post-disaster reviews, for instance, routinely undertaken to assess the effectiveness of Civil Protection systems, are seldom conducted in the majority of SEE countries despite the valuable lessons they can provide for pre-disaster planning by helping to identify both the causes of risk and lessons learned. It should be noted that Turkey, and to a lesser extent Bulgaria and Romania, do conduct post-disaster reviews. Cooperation with EU Civil Protection organisations, where such procedures are routinely implemented, is considered to be an effective way for most SEE countries to close this capacity gap.

Similarly, the amount of human and financial resources committed to disaster risk reduction activities is often at variance with the level decreed by legislation. There is also substantial divergence over the decentralization of disaster risk reduction functions, with some countries giving little authority and few resources to local levels, whereas in other countries the converse is true.

Throughout the SEE region there is a shortage of information on potential vulnerabilities. Detailed maps or models are not yet generally available charting the numbers of human settlements and installations exposed to risk, or detailing the diffusion patterns of landslides, average return periods of flooding, or even identifying hazardous transport routes. Similarly, models have yet to be created showing the resilience of the existing building stock and infrastructure in the event of a disaster such as an earthquake.

This lack of important data means that the ability of SEE countries to interface with the EU-led Global Monitoring for Environment and Security (GMES) initiative is seriously compromised. Across the region monitoring systems need to be updated and in some cases rebuilt from scratch. Early-warning systems are generally in need of strengthening, although those of Bulgaria, Romania and Turkey appear to be more developed.

Moreover, the report finds that the need to disseminate disaster risk reduction information to all sectors, levels, key institutions and other stakeholders is not yet fully perceived and the mechanisms do not yet exist to facilitate the interaction of development players around a disaster reduction agenda. Overall there is still a need to fully appreciate the multi-sectoral cooperation and coordination that disaster risk reduction requires. This failure to engage often starts at the level of schools, where risk reduction information tends not to be incorporated into education programmes. At national level, there is often insufficient interaction between national scientific bodies and Civil Protection organisations, a situation compounded by the weak state of scientific research in many SEE countries compared to levels in the EU, where research programmes benefit from more funding. The exceptions are Bulgaria, Romania, Turkey and, to a certain extent, Serbia.

When the analysis turns to examining how effective national policies are at addressing the reduction of disaster risk a gap is identified, particularly in the enforcement of certain regulations. This is the case with building codes, which present a challenge to several countries, although there is a more systematic incorporation in Bulgaria, Croatia, Romania, Serbia and Turkey. There is also divergence in the ways in which administrations enforce the use of agreed disaster risk reduction procedures on major infrastructure projects. This is especially significant because SEE countries are in the process of rehabilitating their infrastructures. The lack of resilience of infrastructure is a major threat to long-term development goals.

Throughout the report detailed information is presented in a series of tables outlining such factors as the degree of impact of specific hazards, the degree of preparedness, the efficiency of alerts and warnings and the efficiency of emergency responses. The quantity of human and financial resources used in Civil Protection is also documented and a summary of the findings can be seen in Table A.

The table shows that the proportion of GDP spent on Civil Protection is relatively consistent across all countries studied, varying between a low of 0.02 per cent in the FYR of Macedonia to a high of 0.33 per cent in Sweden. There is, however, a large variation among countries in terms of the distribution of human and financial resources between local and central levels. There are also large variations between countries in the proportions of the active population involved in Civil Protection during major emergencies, with the figures in certain countries being swollen by the sizeable number of volunteers active during emergency situations.

Table A: Human and financial resources used in the Civil Protection sectors of SEE countries and the three EU case studies.

Country	Active Population	GDP (€ Million)	***	Human resources [% of active population]				Annual cost [% of GDP]	
				Central		Local		Central	Local
				Normally	Large Emergencies	Normally	Large Emergencies		
Italy	39000000	1336000		0.0016	0.0067	0.006	4.00	0.10	0.02
Slovenia	1400000	41000		0.024	0.195	0.013	4.15	0.013	0.066
Sweden	6000000	254000		0.017	0.017	0.27	0.27	0.076	0.25
Albania	2100000	15000	*	0.0012	0.0012	0.0214	0.092	0.013	0.027
Bosnia and Herzegovina	4600000	22000		0.0009	0.0009	0.013	0.013	0.006	0.032
Bulgaria	5300000	65000							
Croatia	3000000	51500		0.018	0.05	0.006	2.09	0.017	0.081
FYR of Macedonia	1400000	13000		0.034	0.42			0.02	
Moldova	2500000	7500		0.11	0.12			0.033	
Montenegro	430000	4500	**			0.13	0.23		
Romania	15000000	183000		0.008	1.10			0.013	
Serbia	5000000	56000		0.010	0.012	0.06	0.06	0.0216	0.0234
Turkey	47500000	664000		0.0008	0.0008	0.007	0.12	0.0023	0.0453

\* Figures for 2006

\*\* IMF projections for 2007

\*\*\* Exchange rate based on average value in June 2007 (€1 = US\$1.34)

## Conclusions and Recommendations

For most SEE countries, efforts are still ongoing to ensure that the mechanics of disaster risk reduction are in place. There is an understanding that in order to achieve this Government commitment is vital.

There is still a need to fully engage stakeholders across the region in a dialogue to help build a national consensus on the need for disaster risk reduction. It is significant to note that in SEE countries the perception that citizens have the right to be protected from excessive risk is negligible compared to the level of perception among citizens of the EU.

By examining preparedness and response it emerges that in order to integrate disaster risk reduction there is a need for plans to be diffused to all administrative levels, financial resources allocated to emergency response and recovery programmes, and procedures systematically established for post-event analysis so that past mistakes can be avoided and underlying causes of risk identified.

The report concludes that while a regional approach and cooperation is extremely beneficial, country-specific strengths and weaknesses need to be addressed.

It recommends that across the SEE region, technical and scientific bodies that provide main data and information used by Civil Protection are strengthened and developed and given access to the EU Emergency Response Core Service (ERCS) of GMES, among other facilities. The report calls for the development of human resources to be prioritised alongside technological innovations.

South Eastern Europe has a history of vulnerability to disasters caused by natural and technological hazards, many

of which transcend borders and exceed the management capacities of individual countries. Due to their high levels of vulnerability, and the relatively small size of the countries in the SEE region, all national administrations would benefit from closer regional cooperation in disaster risk reduction, both technologically and organisationally. The areas in which such transnational cooperation would be of most value are:

- Vulnerability information, including detailed maps and models charting the numbers of human settlements and installations exposed to risk; the diffusion patterns of landslides; the areas exposed to the risk of flooding and the average return periods of inundation; hazardous transport routes; and models recording the resilience of the existing building stock and infrastructure to earthquake damage.
- Trans-boundary monitoring systems updated or even rebuilt using specifications similar to those of Civil Protection organisations of the EU case studies.
- Trans-boundary early-warning systems, established adopting specifications similar to those of Civil Protection organisations of the EU case studies.
- Strengthened capacity building of technical and scientific bodies and enhanced communication between scientific bodies and Civil Protection sectors.

The launch of GMES ERCS services and interfaces is cited as an opportunity to maximise the potential benefits of a thorough upgrade of the Civil Protection systems in South Eastern Europe.



# 1

## *Civil Protection in the European Union*

## 1.1 The concept of Civil Protection in Europe

### 1.1.1 Use of the term Civil Protection

This report builds on a number of policy and review documents and was prepared as part of an initiative aimed at enhancing the Civil Protection systems of South Eastern Europe in line with the Hyogo Framework for Action<sup>4</sup>. To ensure consistency and clarity of results and findings the terminology used is based on that of the UNISDR<sup>5</sup>.

### 1.1.2 Origin of Civil Protection

The concept of Civil Protection emerged in Europe in the early 1980s and followed the establishment of two parallel initiatives in France and Italy dealing with disaster mitigation. Both countries, responding to social concern over the devastating potential of catastrophic events, initiated a highly beneficial period of cooperation. As early as 1980, France established the *Plan d'Exposition aux Risques*, a national programme to assess the geophysical environment and map natural and man-made hazards, examining the level of risk they posed to the public. In Italy, three groups of the National Research Council were given the task of assessing the level of risk posed by floods, landslides, volcanic activity and earthquakes, and of developing technical policies for risk mitigation. In both countries it was clear that the exposure to risks was very high, especially in urban areas.

Given the diverse nature and extent of the risks many European nations face it is easy to understand the scale of the task presented to national administrations. The type of disaster hazards were largely dependent on the geography and climate of the individual nations concerned. Many southern States were especially prone

to earthquakes or forest fires, while in northern Europe disasters tended to be smaller and related to technology, such as industrial or transport accidents.

In some cases, countries were able to cope with such catastrophes on their own. But often, emergency assistance was required from other nations and it was in this context that the European concept of Civil Protection emerged. It was recognised that different countries had developed different areas of expertise to cope with the different types of hazards they faced and that there were benefits and efficiencies to be gained through cooperation.

An important aspect of Civil Protection has always been an attempt to harness the particular expertise of different nations through the exchange of ideas and experiences, allowing experts from across Europe to learn through each other's good practices to improve the overall capacity to cope with disasters. The potential benefits of transnational cooperation are one of the core features of Civil Protection in a European context.

In its simplest form, the aim of Civil Protection is to minimise the impact of catastrophic events<sup>6</sup>. Civil Protection organisations are those which coordinate the necessary actions to mitigate and, where possible, prevent the risk of disasters. Civil Protection is involved with the construction of specific knowledge, the ability to issue early warnings, the ability to reach people through different information channels, the capacity to coordinate human resources and the technology needed to cope with calamities. It includes the non-structural measures that will positively impact on governments' abilities to respond effectively to disasters<sup>7</sup>.

### 1.1.3 Public perception of risk

A primary aim of Civil Protection is to make the public aware of the risks it faces and offer reassurances that adequate resources are available to minimise those

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4 Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, UNISDR, extract from the final report of the World Conference on Disaster Reduction, 2006.

5 Terminology: Basic terms of disaster risk reduction. The UNISDR Secretariat developed basic definitions on disaster risk reduction in order to promote a common understanding on this subject, for use by the public, authorities and practitioners. The terms are based on a broad consideration of different international sources. This is a continuing effort to be reflected in future reviews, responding to a need expressed in several international venues, regional discussions and national commentary. To find out more see: <http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm>

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6 Bertolaso G., Lecture for the Conference on National Safety and Security: responding to risks to citizens, communities and the nations, January 28, 2008, The Netherlands.

7 In the Concept note of the South East Europe Risk Mitigation and Adaptation Program (WB 2007), regarding the proposed programme objective and components, the first suggested phase is the 'non-structural and less expensive measures that will have significant positive impact. These include activities and investments that will build the capacity of governments to respond effectively to disasters, such as weather forecasting and early-warning systems, development of disaster insurance schemes, land-use planning and building code enforcement...'



risks. Several factors influence the public perception of risk. The first is the sheer scale of previous disasters. Consider these facts:

- The natural catastrophe that produced the biggest economic loss, before Hurricane Katrina, was an earthquake<sup>8</sup> recorded in January 1995, in Japan, which caused economic losses exceeding US\$150 billion.
- The largest number of casualties ever recorded was also due to an earthquake in Japan, in September 1923, in which more than 140,000 people were victims.

The immense scale of sometimes devastating events such as earthquakes and volcanic eruptions can affect the way the public perceives natural hazards and the degree of risk they represent. In terms of public perception of loss, as well as actual physical loss, earthquakes along with hurricanes are the individual hazards that usually produce the highest number of casualties, and the highest asset damage, per event. However, in terms of actual cumulative human and economic loss, floods and forest fires are the most costly events, occurring as they do with much greater frequency.

This is the pattern globally and it is one which is repeated across the SEE region<sup>9</sup>. On the level of public perception, earthquakes remain the most recognised and understood threats, while perceptions of the threats posed by flooding and forest fires underestimate their real impact.

There is similar misperception regarding the degree of risk posed by technological hazards, with nuclear facilities considered to represent the biggest hazard whereas the risks posed by the far more common problem of accidents during the transport of industrial or dangerous substances are underestimated. Of course, the perception of risk is necessarily a subjective judgement and it varies with age, education and socio-economic position.

Fostering an accurate perception of risk is therefore one of the targets of a developed Civil Protection system. A

public with a proper, proportionate understanding of the level of risk is more likely to respond appropriately in the event of a disaster and this could help reduce the destructive impact of that disaster event.

The development of a Civil Protection system should in itself engender a degree of confidence among the public once it starts to perceive an appreciable degree of protection from disasters. The right of a person to be protected from catastrophes, such as climatic extremes, earthquakes, or industrial or infrastructural failures, is a characteristic of social and economic development. In most European countries the right of the citizen to safely stay home, work or travel anywhere in the country is acknowledged by national law. Indeed, one of the indicators of the diffusion of the public perception of the right to be protected by social institutions against possible disasters is the opportunity that citizens have to take legal action against Civil Protection authorities should they fail in their duties to protect.

A second indicator of the reliability and proper functioning of a Civil Protection organisation is its ability to inform the public of the procedures it relies upon to alert, rapidly assess and intervene when a disaster occurs. The establishment of such formal procedures, covering the operation of Civil Protection, introduces a quantifiable measure of the effectiveness of that system. Concomitantly, this can work as a safeguard for decision-makers in respect of their liabilities. The knowledge that warnings will be issued with clear and sound procedures also helps to create a consensus towards the authority, which in turn helps it in its risk reduction efforts, such as with the control of land or property use.

The perception of Civil Protection in each country will be presented as a short preface to each country report.

Modern Civil Protection in post-industrial societies, such as those of most European countries, has two major tasks: the first is political/sociological, in the sense that the new organisation has to fully interact with existing political/social institutions in order to achieve consensus on a number of issues, such as land use; the second is technological, meaning that Civil Protection must make use of the most advanced and efficient tools to observe and predict geophysical factors influencing people and their properties. If these tasks are performed properly then Civil Protection is perceived to be reliable.

<sup>8</sup> Munich Re Group, Topics Geo - Natural Catastrophes 2006: analysis, assessments, positions. In knowledge series, 2006.

<sup>9</sup> South Eastern Europe Disaster Risk Mitigation and Adaptation Program, Concept Note, WB, 2007.

Civil Protection conceived in this way, beside its traditional focus on disaster preparedness and response, can stimulate the engagement of governments to address appropriate disaster risk reduction policies. This can include the participation of Civil Protection sectors in National Platforms for disaster risk reduction<sup>10</sup>, sometimes as coordinators<sup>11</sup> of these Platforms facilitating the actions of their members.

## 1.2 EU Civil Protection structure

The complexity and scope of multidimensional challenges in dealing with disasters require a comprehensive approach, as well as a need to balance national responsibility and European solidarity<sup>12</sup>. European citizens expect the Union to protect their lives and assets inside the EU, and at the same time deliver effective disaster assistance in other parts of the world as an important expression of European solidarity.

Cooperation allows for the pooling of resources and the maximising of collective effort. It is a good example of the value of transnational cooperation at a European level, where national responsibility for dealing directly with the management of the effects of disasters remains unchallenged, but the abilities of countries to deal with those emergencies are enhanced through mutual assistance.

The European Commission is the body responsible for supporting and supplementing efforts at national, regional and local level with regard to disaster prevention, the preparedness of those responsible for Civil Protection and the intervention in the event of a disaster.

The legislative framework for European Civil Protection enables the Commission to establish a framework for effective and rapid cooperation between national Civil Protection services when mutual assistance is needed. The

Commission provides for seminars, expert exchanges, workshops and other training tools in cooperation with Civil Protection training institutions or similar establishments. Information sharing and highlighting good practice ensures that Civil Protection teams are both compatible with each other as well as complementary.

Over the years, the EU has developed major tools through which all its policy objectives in the field of Civil Protection may be achieved. The Community Action Programme, which supported projects in the field of prevention, preparedness and response to disasters caused by natural hazards, was adopted in 1999 and ended in 2006. The Community Civil Protection Mechanism, which was created in 2001 to reinforce the cooperation in Civil Protection assistance interventions, has now developed into a robust platform for European Civil Protection cooperation. Thirty countries (the 27 EU Member States plus Iceland, Liechtenstein and Norway [Croatia is due to join in 2009]) participate in the Mechanism, so as to ensure an effective delivery of assistance in emergencies which may require urgent responses.

How the Community Civil Protection Mechanism operates within the European legislative framework, its major roles and its mandates are the subject of the following section. It must be emphasised at this juncture that the Mechanism is not the only EU institution with a potential role in a post-disaster environment. The European Commission Humanitarian Aid department (ECHO) plays a fundamental role in the provision of humanitarian aid at European level and a brief summary of its objectives are provided in section 1.2.3. Section 1.2.4 briefly summarizes the outlook for European Civil Protection.

### 1.2.1 Community Civil Protection Mechanism

The current European legislative framework covering Civil Protection has its origin in the May 1985 Ministerial Meeting in Rome. Of the several resolutions adopted over subsequent years, the most significant was that adopted in July 1991<sup>13</sup> dealing with the improvement of mutual aid between Member States in the event of natural or technological disasters. It established the means by which a Member State was able to request assistance

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10 A National Platform for disaster risk reduction can be defined as a nationally owned and led forum or committee of multi-stakeholders. It serves as an advocate of disaster risk reduction at different levels and provides coordination, analysis and advice on areas of priority requiring concerted action through a coordinated and participatory process. A National Platform for disaster risk reduction should be the coordination mechanism for mainstreaming disaster risk reduction into development policies, planning and programmes in line with the implementation of the HFA. It should aim to contribute to the establishment and the development of a comprehensive national disaster risk reduction system, as appropriate to each country.

11 In Europe examples are among others: Italy, Sweden and Spain.

12 EC, Communication from the Commission to the European Parliament, the Council on Reinforcing the Union's Disaster Response Capacity. Brussels, 5 March 2008. COM(2008) 130 final.

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13 Resolution of the Council and the representatives of the Governments of the Member States, meeting within the Council, of 8 July 1991, on improving mutual aid between Member States in the event of natural or technological disaster. (OJ n° C 198 of 27/7/1991, p. 1).

from other Member States in case of a disaster entailing serious physical damage or danger to persons, property or the environment and clearly exceeding that Member State's own capabilities, in accordance with the principle of subsidiarity. In the event of such a disaster, assistance would take the form of the early dispatch of aid teams, equipment and materials.

A Council decision in October 2001<sup>14</sup> established the Community Civil Protection Mechanism, which was intended to facilitate reinforced cooperation in Civil Protection assistance interventions, including situations where there may have been an imminent threat of major emergencies. A recast of this Council Decision was adopted in November 2007.

It was recognised that in emergency situations teams needed to be mobilised rapidly, with coordination and flexibility, and to this end the Mechanism was given the following tools: the Monitoring and Information Centre (MIC), the Common Emergency and Information System (CECIS), Civil Protection modules and a training programme, among others.

The MIC is operated by the Directorate General Environment of the European Commission and is permanently accessible. It gives countries access to a platform collecting information on the Civil Protection means available among all participating states. When hit by a major disaster, Member States or third countries can send an assistance request to the MIC. The request is then immediately forwarded to all participating countries, whose responses are compiled by the MIC and provided to the requesting country, which can pick and choose the help available in accordance with its priority needs.

Moreover, the MIC provides the participating countries with information updates as a situation evolves. It can also send on-the-spot experts in order to assess needs and coordinate incoming assistance at the field level. The MIC is assisted by the EU Joint Research Centre, which provides technical support through modelling, satellite applications and integrated analysis.

Emergency communication among the participating states is ensured by the CECIS, a secure alert and notification application. It provides an integrated platform to send

and receive alerts and details of assistance required, to make offers of help, and serve other information-sharing purposes.

Civil Protection modules are made of national resources from one or more Member States on a voluntary basis. They constitute a contribution to the Civil Protection rapid-response capability called for by the European Council in its Conclusions in June 2005, and by the European Parliament in its Resolution on the tsunami disaster in January 2005. Thirteen types of Civil Protection modules have been identified by the Commission together with Member States.

The idea of establishing Civil Protection modules to strengthen the European response to disasters caused by natural or technological hazards was launched by Member States in the wake of the December 2004 tsunami in South Asia. The recast of the Council decision establishing a Civil Protection Mechanism emphasises the importance of developing a European rapid-response capability based on the Civil Protection modules of the Member States. The decision entered into force on 8 November 2007 and Member States were asked to identify and register Civil Protection modules by 8 May 2008. During the last two years the Commission and the Member States have worked closely together to develop the implementation rules for Civil Protection modules. These rules provide the technical framework for 13 types of modules, such as pumping and purification of water, aerial fire-fighting and urban search and rescue, and for a technical assistance support team that may support MIC assessment and/or coordination teams. More than 90 Civil Protection modules of different types have been registered in the system so far.

Finally, a training programme has also been set up with a view to improving the coordination of Civil Protection assistance interventions by ensuring compatibility among the intervention teams from the participating states. It also enhances the skills of experts involved in Civil Protection assistance operations through the sharing of good practices. This programme involves training courses and a system of exchange of experts of the participating states. The training programme is complemented by a number of large scale simulation exercises undertaken in the framework of the Mechanism each year.

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<sup>14</sup> European Council Decision of 23 October 2001 establishing a Community mechanism to facilitate reinforced cooperation in civil protection assistance interventions, 2001/792/EC, EURATOM.

## 1.2.2 EU humanitarian interventions

The European Union as a whole (i.e., the Member States and the Commission) is one of the world's main humanitarian aid donors. In the European Commission, the Humanitarian Aid department (DG ECHO) is responsible for humanitarian assistance. The Council regulation (EC) n° 1257/96<sup>15</sup> mandates DG ECHO to provide emergency assistance and relief to the victims of disasters caused by natural hazards or armed conflict outside the European Union, addressing the aid directly to those in distress. The mandate also covers short-term rehabilitation and reconstruction work as well as preparedness for risks of disasters caused by natural hazards. Since its establishment in 1992, DG ECHO has funded humanitarian aid in more than 85 countries. DG ECHO implements its mission through partner organisations (NGOs, UN agencies and the Red Cross Movement [ICRC, IFRC]). DG ECHO provides funding for activities in the following humanitarian sectors of intervention:

- Water and sanitation
- Health and psychosocial support
- Food aid and food security
- Shelter and rehabilitation
- Emergency job creation
- Humanitarian protection
- Humanitarian coordination
- Disaster preparedness

Moreover, DG ECHO promotes and coordinates community-based disaster preparedness activities in seven disaster-prone regions of the world through its DIPECHO programme. DG ECHO also encourages the integration of disaster risk reduction components into its relief interventions and promotes disaster risk reduction through advocacy efforts, notably towards development services and agencies. Such initiatives are in line with the EU Consensus on Humanitarian Aid and the recently adopted Communication on an EU Strategy supporting disaster risk reduction in developing countries. These actions reflect the contribution of DG ECHO to the implementation of the HFA.

DG ECHO has a network of approximately 100 field experts in countries where humanitarian assistance is provided. The field experts are tasked to assess the general

humanitarian situation in the country and the needs of the population affected by a crisis, advise DG ECHO on the programming of its assistance and monitor the implementation of humanitarian aid projects. Experts based in regional offices are also used as surge capacity and can be immediately deployed to a country affected by an 'onsudden' emergency where DG ECHO has no presence and/or to reinforce DG ECHO's presence in a given country.

DG ECHO spends more than €700 million a year on financing humanitarian projects and has two sources of funds: the general European Commission budget and the European Development Fund. The general budget for humanitarian aid is divided into four portions: the financing of humanitarian operations, which constitutes the biggest portion; food aid activities, started in January 2007; the financing of operational support and disaster preparedness operations, and finally; a budget line for support expenditure.

To be able to respond rapidly to specific aid requirements resulting from events which could not have been foreseen when the budget was established, DG ECHO may also call on an Emergency Aid Reserve<sup>16</sup>.

## 1.2.3 Outlook for EU Civil Protection

*“When responding to disasters, Europe is strongest when it combines its capacities and benefits from its diversity and different expertise<sup>17</sup>.”*

Commission President Mr. José Manuel Barroso

The words of the Commission President José Manuel Barroso are essential to understanding the immediate future of Civil Protection at a European level, and they are the best introduction to the changes that have recently been urged by the European Commission.

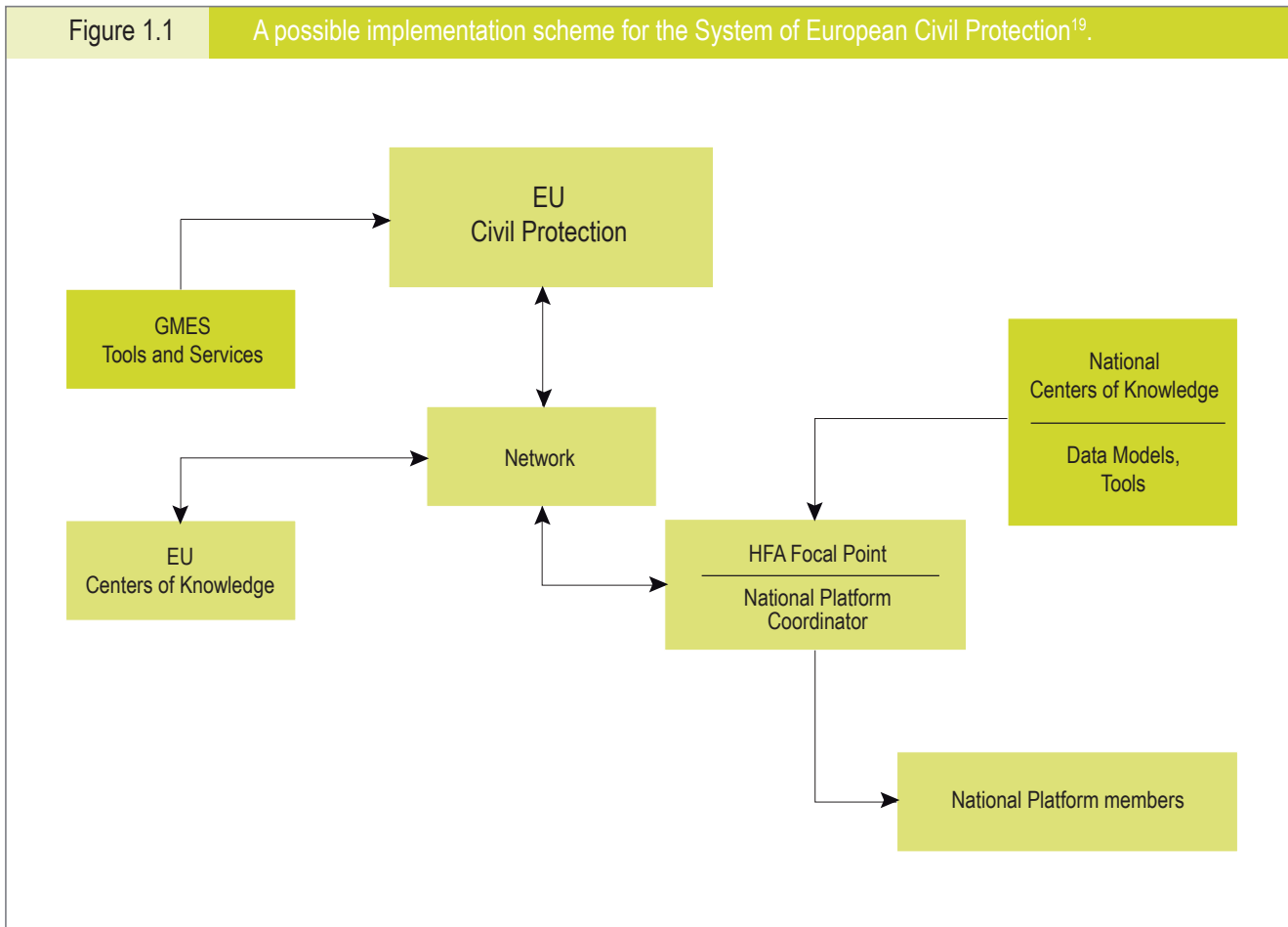
In 2006 a report on European Civil Protection commissioned by the President of the Commission was produced by former European Commissioner Mr. Michel Barnier<sup>18</sup>. The report centres on the creation of

15 Council Regulation (EC) No 1257/96 of 20 June 1996 concerning humanitarian aid.

16 The mobilisation of the Emergency Aid Reserve requires a trilateral agreement among the Commission, the Council and the Parliament.

17 Barroso J.M., (Commission president), Better disaster response – at home and abroad, 5 March 2008. Available online at [http://ec.europa.eu/commission\\_barroso/president/focus/disaster-response/index\\_en.htm](http://ec.europa.eu/commission_barroso/president/focus/disaster-response/index_en.htm)

18 Barnier M., For a European civil protection force: Europe aid, May, 2006.



a European Civil Protection Force (Europe Aid), using Member States' resources in much the same way as the Community Civil Protection Mechanism, although the Force would also be able to acquire additional resources at EU level. The focal point of the proposed force would be the MIC, reinforced with experts from Member States. Some of former Commissioner Barnier's proposals were accepted and inserted into the recent European legislative framework<sup>20</sup>, entrusting new tasks to the Commission in the area of Civil Protection.

Subsequently, following the principles introduced by the words of President Barroso, in March 2008, a communication of the Commission addressed the

strengthening of the Union's disaster response capacity<sup>21</sup>. The Communication suggests a number of improvements that represent a further step in the rationalisation of disaster response instruments. Some concern the functioning of existing instruments, while others are relevant to the development of new 'cross-cutting' tools, which are designed to ensure more effective coordination. With reference to the existing tools, suggestions for reinforcing the Community Civil Protection Mechanism and European Humanitarian Aid are introduced. To reinforce the Mechanism it is proposed to:

- Improve the European Civil Protection response capacity. With reference to disasters such as floods and forest fires, gaps in response resources should be identified and options for filling them assessed, including developing additional European resources complementary to capacities of the participating states.
- Build up the MIC so it can fulfil the role of a genuine operational centre for European Civil Protection

<sup>19</sup> Courtesy of EU Enterprise and Industry Directorate, Tender on Supporting the implementation of an operational Global Monitoring for Environment and Security service in the field of emergency management, 27 May 2008.

<sup>20</sup> In addition to the references listed in paragraph 2.2, topics regarding civil protection are inserted also in the Treaty of Lisbon, once ratified, signed by the Heads of State or Government of the 27 Member States in Lisbon on 13 December 2007.

<sup>21</sup> EC, Communication from the Commission to the European Parliament and the Council on Reinforcing the Union's Disaster Response Capacity. COM(2008) 130 final.

interventions. This would include the development of the centre into a larger structure featuring monitoring, early-warning and other analytical capabilities.

- Create a European Disaster Response Training Network (currently transformed into the European Training Arrangements), and improve disaster preparedness measures, early warning systems and use of the single European emergency number '112'.

It should be noted that the realization of the interfaces and procedures between users is already under way. But in order to achieve this, strict interaction between SEE countries and the System of European Civil Protection needs to be enhanced. A possible model of how such a system could operate is shown in Figure 1.1, which is a synthesis of the design of the EU Emergency Response Core Service (ERCS) of the GMES.

The different Civil Protection structures of SEE countries have varying levels of organisational and technological development, especially in relation to the technical bodies that support them. Consequently, in order to fully benefit from the advantages offered through enhanced interaction with the System of European Civil Protection and the support of the EU ERCS, a number of these countries need to rapidly adapt their structures.

It is clear that these suggestions are intended to strengthen the European response capability by exploiting existing national capabilities and integrating them into a coordinated and flexible structure.

The EU is about to start implementing some initiatives aimed at disaster management/Civil Protection in SEE. First, a two-year programme on 'Civil Protection cooperation with the candidate countries and potential candidates' is under preparation. The programme is envisioned to contain three strands of activities, namely a) training and exchanges of experts, b) regional simulation exercises and participation of SEE teams in the Mechanism exercises, and c) a series of seminars on topics, such as the culture of lessons learned, early-warning systems, host-nation support and '112'. Second, the implementation of the Disaster Risk Reduction Initiative (DRRI) is about to begin in cooperation with the UNDP and the World Meteorological Organisation (WMO). The two main purposes of the DRRI are: a) facilitating the establishment of a regional disaster risk reduction strategy and b) increasing the availability of regional-level data for vulnerability assessment. In this, the DRRI will complement the Mechanism's outreach in the region.







# 2

European Union  
case studies

## 2.1 Three European models

While there is no 'one size fits all' approach to Civil Protection in the EU, three countries have been used as case studies to demonstrate the functioning of European Civil Protection. These countries are Italy, Slovenia and Sweden.

In this section, the principal features of Civil Protection in each country will be outlined. This will include an examination of public perceptions of Civil Protection, the legislative framework and Civil Protection structures. It will also include an assessment of how organisations interact with existing social institutions and, if any, particular points of good practice of different bodies.

One issue that previous reports dealing with Civil Protection have yet to address is to what extent the demography of a country affects the political and administrative organisation of that territory and, consequently, the organisation of responsibilities for managing risk assessment and risk reduction activities. Because larger populations generally require more complex organisations to deliver services, this review categorises Civil Protection organisations in terms of the sizes of populations they are responsible for. The categorisation, which is repeated as a footnote on the first page of each country report, is as follows:

- *Level 0*: for populations from 10 million to 100 million
- *Level 1*: for populations from 1 million to 10 million
- *Level 2*: for populations from 100,000 to 1 million
- *Level 3*: for populations from 10,000 to 100,000

There is no category for populations under 10,000 because assessments at this level are often affected by factors that are difficult to quantify, such as the influence of traditional knowledge or cultural norms.

As has been mentioned previously, how the public perceives and deals with risks and hazards can have an important bearing on the efficiency of a Civil Protection system. Although it is beyond the scope of this report, how people use traditional knowledge to understand risk and how it affects their behaviour needs to be considered if a modern Civil Protection system is to work effectively. An efficient Civil Protection system is one which takes account of the value of traditional knowledge as well as the value of modern technological innovations. There is important interplay between the two.

## 2.2 Italy

### *Public perception of Civil Protection*

The right of citizens to be safe in their homes, places of work and while travelling is a fundamental duty of national governments. Should they fail in this duty it is the right of citizens to instigate legal proceedings against the administration and it is their willingness to do so that is used as an indicator of the level of public sensitivity to the concept of Civil Protection. In Italy, there is a growing appreciation of the rights of citizens with regard to Civil Protection and this right has already been tested in court.

In 2006 a Criminal Court of First Instance sentenced for manslaughter the mayor of a village in the Italian Riviera after a man drowned in an area recognised as being exposed to the risk of flooding. The mayor was condemned for failing to alert the public following the procedures prescribed by the regional government, which had issued an alert.

In 2008 the Court of Second Instance, reviewing the judgement, acquitted the accused but condemned for the same offence one of the officials of the Aosta Valley region for failing to properly interpret the technical information that should have resulted in an evacuation alert for people exposed to the risk of debris-flow.

That there are several similar cases currently under review is testament to the high degree of public awareness in Italy regarding Civil Protection.

### *Demography and administration*

Italy has a population of about 60 million people, giving it an order of magnitude of *Level 0*<sup>22</sup> according to the classification used in this review. The country is divided into 20 political regions, each with its own local government and parliament. Each region is entitled to legislate independently on a number of issues, and particularly on the issues of land management and risk reduction. Regions differ in size, but on the whole have orders of magnitude of *Level 1*.

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22 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

Metropolitan cities with orders of magnitude of *Level 2* have responsibilities over land management and risk reduction, but are not entitled to legislate: they have to strictly follow national and regional rules. Smaller towns and villages are organised into municipalities, and are, like metropolitan cities, governed by a mayor and an elected council. However, for the purposes of land management and risk reduction they are organised into groups of municipalities, called provinces, and governed by a president and an elected council. Provinces have orders of magnitude of *Level 2* and, like metropolitan cities, are not entitled to legislate: they have to follow strict regional rules. Small towns vary in size, but generally have orders of magnitude of *Level 3*. The responsibility for managing responses to potential emergencies at this level lies with the mayor.

## 2.2.1 Legislation

Prior to 1985, Civil Protection was mainly involved with search and rescue and was managed by the Fire Brigade National Corps and their local detachments. Fire Brigades were, and are now, under the administration of the Ministry of Internal Affairs. Volunteers, locally organised into a number of non-profit associations, helped to alleviate conditions in an emergency event.

In 1985 the Ministry for Civil Protection was established, its main task being to coordinate resources for search and rescue operations. However, it had an important second function: to develop a national policy for preparedness and prevention.

In 1992, the National Parliament approved a law<sup>23</sup> establishing the National System of Civil Protection, which applied to *Level 0* and below. In the following years, regional laws were passed which followed the guidelines outlined in the national law covering *Level 1* administrations.

There are two major features of the National System of Civil Protection:

1. The categorization of the scale of events giving rise to different emergency conditions. Events are divided into three different categories:
  - a) Events whose consequences can be managed using resources available at *Level 2*. In these cases, responsibility remains with local mayors or with the presidents of provinces. In the

Italian technical language of Civil Protection these episodes are referred as 'events of ordinary criticality'.

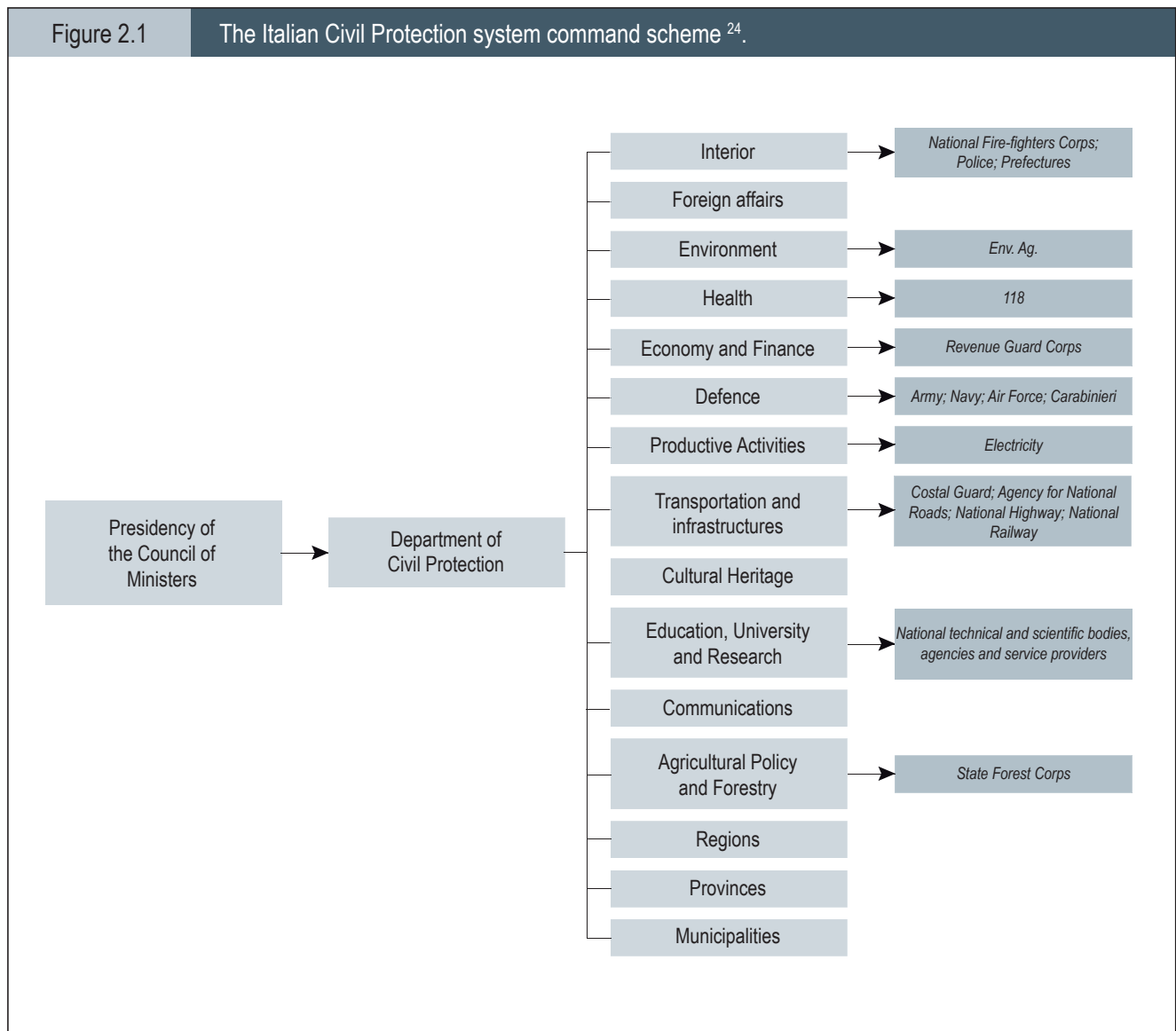
- b) Larger events that may not be managed using resources available at *Level 2*, requiring resources available only at *Level 1*, whose responsibility lies with the president of the affected region.
- c) *Level 0* events which are particularly critical involving several *Level 1* administrations and requiring intensive resources not available at *Level 1*. For these events the responsibility for managing and coordinating human and technical resources, and search and rescue, lies with the President of the Council of Ministers. He delegates the responsibility to the Head of Department of the Presidency of the Council for Civil Protection (in short, the Head of the Department of Civil Protection).

2. The flexibility inherent in the System. Under the terms of the National System of Civil Protection, the President of the Council of Ministers, or the Head of the National Department of Civil Protection, has the authority to call into action, take command of and coordinate all human and technical resources needed to face larger emergencies without any additional special declaration, decree or legislative enactment. The System of Civil Protection includes, by law, a number of authorities, administrations and private and public bodies (including the Army, Navy, Air Force, many ministries and regional governments), and parts of the academic community involved in research into natural or technological hazards within public or private scientific entities or universities.

The System is designed to offer the flexibility and capacity needed to adapt to any emergency situation. It has subsequently been bolstered by a sequence of decrees from the President of the Council of Ministers and the President of the Council, by ordinances from the Head of the National Department of Civil Protection and decrees from the presidents of a number of regional governments.

It is impossible, due to the need for brevity, to refer in detail the legislative developments in Italy, suffice to note that is likely the immediate emphasis for legislators will be the rationalisation of existing laws covering Civil Protection and their synthesis into a unique body of law.

23 Law n. 225, 24 February 1992, «Istituzione del Servizio nazionale della protezione civile.» Published in the Italian Official Gazette n. 64 (Gazzetta Ufficiale) on march 17, 1992, and modified by D.L. n. 393, July 26 1996.



## 2.2.2 Civil Protection structure

Among the risks impacting Italian territory the risks associated with floods and flash floods are significant, as shown in Table 2.1. In mountainous areas, which cover 50 per cent of the country, landslides compound the problem of flash floods, debris-flows and mud-flows. Figure 2.3<sup>25</sup> shows a summary of the data from a national-level inventory produced at the end of the 1990s detailing floods and landslides recorded over the past 100 years.

<sup>24</sup> Courtesy of the Italian Department of Civil Protection.

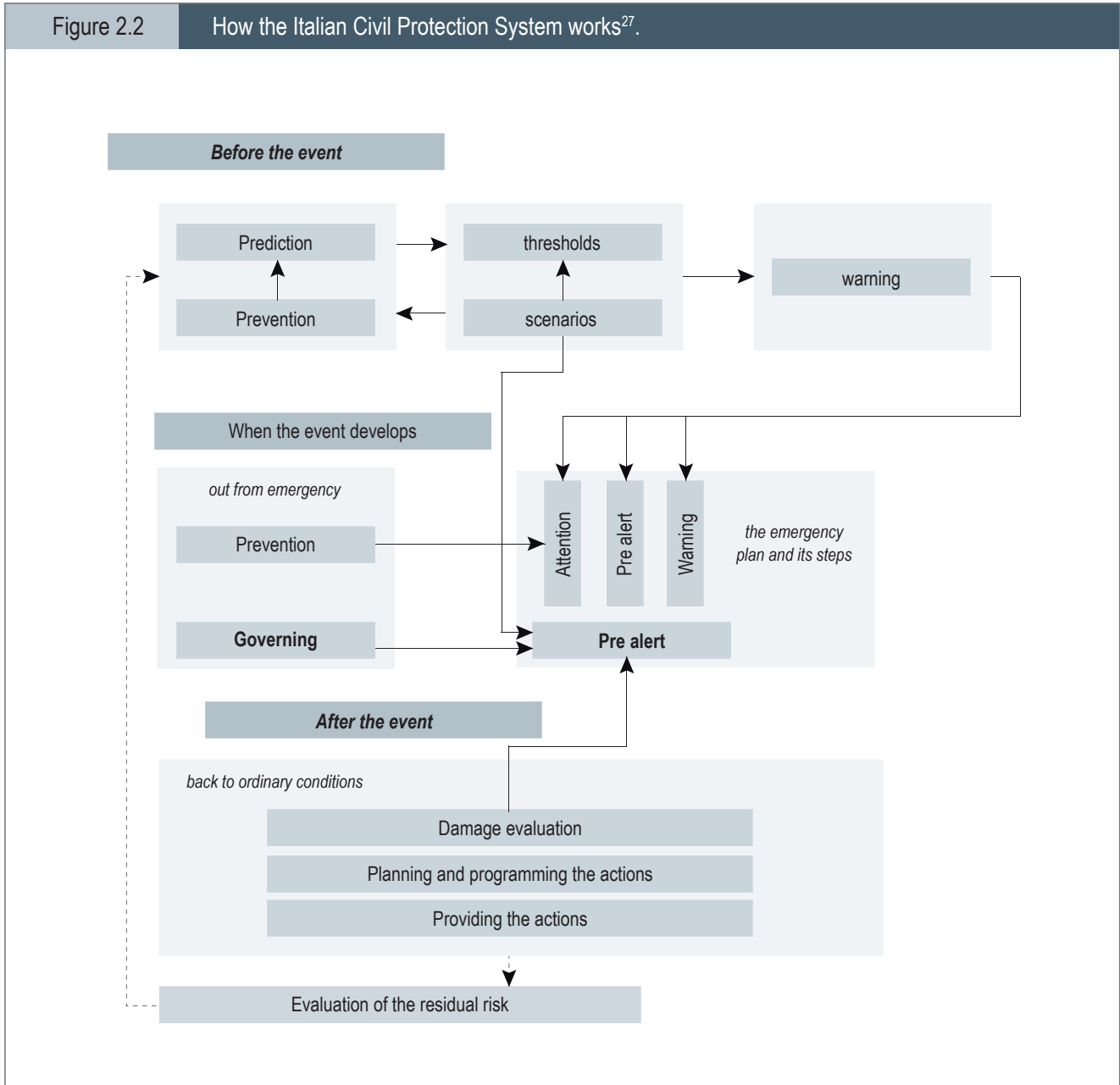
<sup>25</sup> Inventory produced by the Research Group for Prevention from Hydrological and Geological Disasters of the Italian Research Council under contract with the Department of Civil Protection (1998).

The same portion of land is also at risk from forest fires (Figure 2.3c)<sup>26</sup>. Strong winds, referred to in Table 2.1 as ‘tornadoes’, constitute a risk of smaller magnitude in the north western plains and coastal resorts. Sea surges, including the minor risk of local tsunamis caused by underwater landslides or underwater volcanic activity, are present along the Southern coastline.

Volcanic eruptions, both plinian (potentially very violent, explosive eruptions) and effusive (lava flows), are frequent in southern parts of Italy and many islands, except Sardinia. The threat of powerful earthquakes is everywhere, again except Sardinia.

<sup>26</sup> Inventory produced by CIMA Research Foundation under contract with the Department of Civil Protection (2007).

Figure 2.2 How the Italian Civil Protection System works<sup>27</sup>.

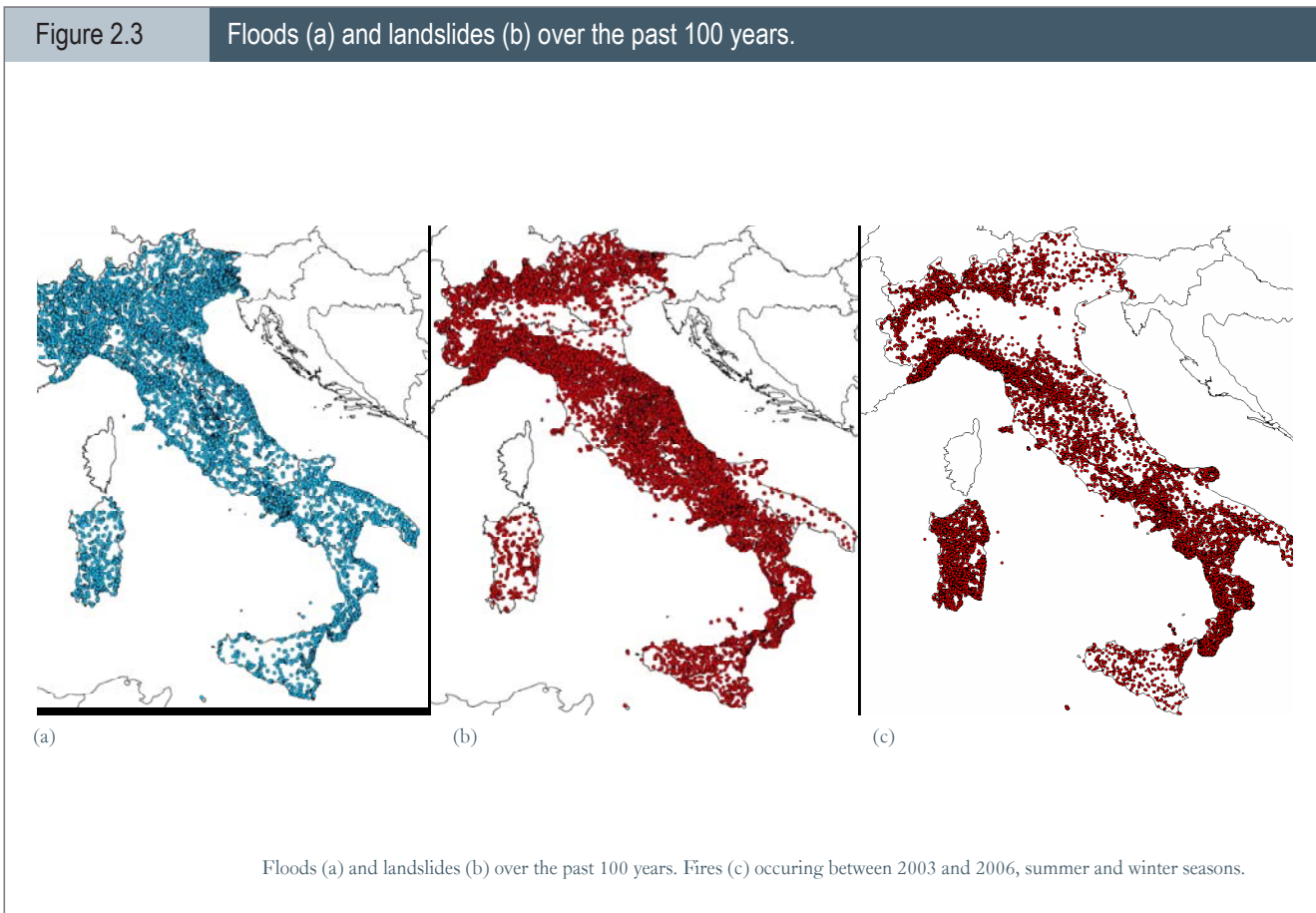


These hazards are managed at both central level (*Level 0*) and at the periphery of the system (*Level 1*). Such synergy is possible thanks to a network of fully-operational decisional-support offices, called *Centri Funzionali*, in which experts, operating from a network of 'situation rooms' all over the country, continuously exchange 24/7/365 prediction data, observational data and evaluations on the evolution of potential disaster scenarios. Their preparedness, including procedures for alerting people and for response and search and rescue operations, is summarized below.

In the early 1990s a flooding risk preparedness policy was initiated by the Watershed Agencies following the passing of a law requiring the mapping of areas exposed to the risk of flooding. The maps had to include information on three return periods: 50, 250 and 500 years. For the population living in such areas a system of self-protection measures was prepared, and frequently refreshed through public simulation exercises. Warnings are diffused to the population living in flood-prone areas according to established procedures. The National Department of Civil

<sup>27</sup> Courtesy of the Italian Department of Civil Protection.

Figure 2.3 Floods (a) and landslides (b) over the past 100 years.



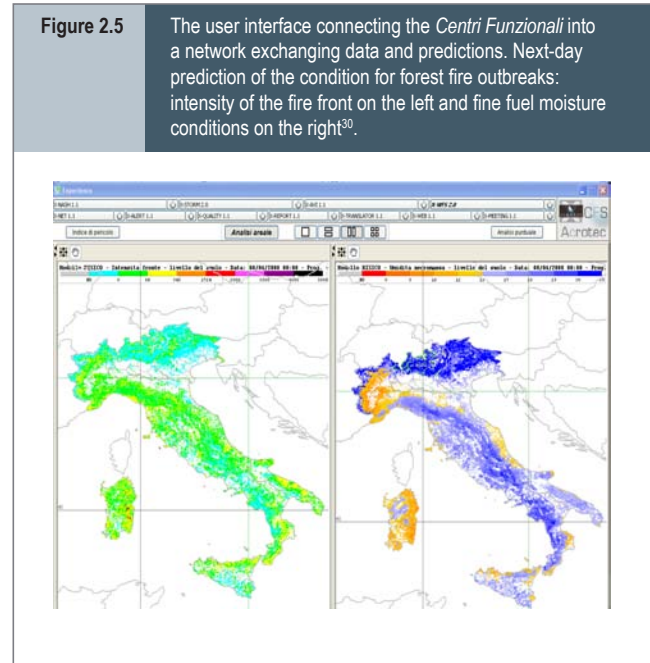
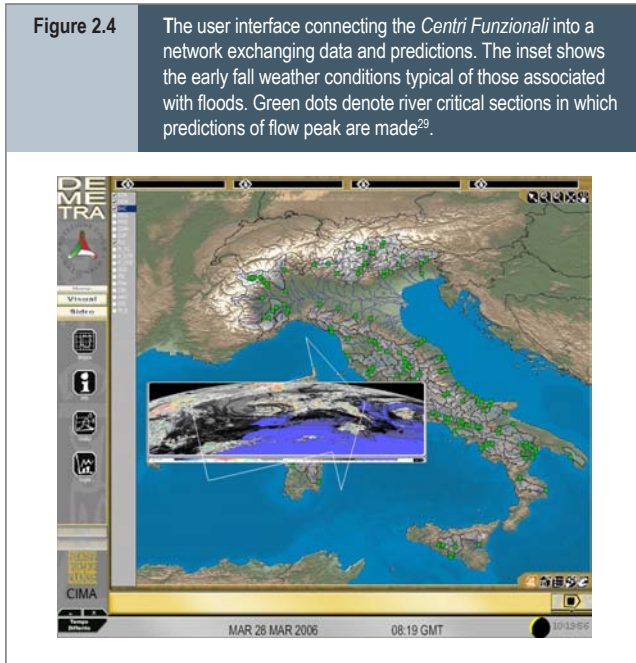
Protection, at *Level 0*, and regional organisations, at *Level 1*, cooperate in updating the maps of flood-prone areas, in simulation exercises, in producing meteorological and hydrological predictions and in issuing alert messages.

The network of decision-support centres has Rome as the reference point under the responsibility of the *Level 0* organisation. Peripheral centres are the responsibility of *Level 1*. Each centre, both in Rome and in the regional capitals, shares real-time numerical information about weather forecasts, the level of rainfall and conditions in the river hydrometric network etc. Responsibility over the issuing of alerts is shared between the National Department of Civil Protection (*Level 0*) and regional governments (*Level 1*). Search and rescue operations are organised at either level according to the scale of the emergency event, using the categories defined in Table 2.1.

Column 1 of Table 2.1 summarizes the operational structures outlined above. Figure 2.4 provides a sample of outputs of numerical flood-risk predictions diffused

within the network of *Centri Funzionali*.

Due to the elusive character of landslides, debris-flows and mud-flows, accurate mapping of the areas at risk is not possible in the same way as it is for flood-prone areas. The maps denote only the areas where the phenomena, based on past experience and geomorphologic analysis, are more frequent. Unfortunately, definition of impact areas and probability of occurrence is not possible. Real-time predictive tools are not established, and frequently alerts are issued together with flood alerts. Risk maps are available in only a few *Level 1* regional organisations. Column 2 of Table 2.1 provides a summary of this information.



The risk of forest fires is very high and covers all areas (*Level 0*). Most regions (*Level 1*) in central and southern Italy and the islands are exposed to the risk of summer fires, while the northern regions suffer the risk of dry winter fires. A few regions suffer from both.

Fire mitigation requires complex organisation to optimise the allocation of the human resources of Forest Corps (managed at *Level 1*) and Fire Brigade Corps (managed at *Level 0*), together with the fleet of fire-fighting aircraft delivering water and fire retardants. The use of the fleet of aircraft is optimised at *Level 0*. Each day during the fire season, aircraft are moved to suitable landing areas all over the country in order to minimize their flight time to areas where fires are considered most likely. This allocation is based on a prediction for ground conditions conducive to the outbreak of fires, with models forecasting the dryness of vegetation, the amount of dead wood, prevailing wind conditions and evaporation rates. An example of a *Level 0* map of predicted fire-risk conditions is shown in Figure 2.5.

Preparedness tools, alert and warning procedures and mitigation activity are all effective, and public perception of Civil Protection actions in this field is high. Cooperation with the countries of Mediterranean Europe and SEE is ongoing and its strengthening through EU services would be beneficial.

Column 3 of Table 2.1 contains an overview of this information

The risk of significant damage due to tornadoes, sea surges and tsunamis is considered small on Italian territory and preparedness, alert procedures, mitigation activity and search and rescue organisation in this area are consequently not especially developed. See columns four, five and six of Table 2.1 for details.

Active volcanoes represent a very high risk in several locations:

Mount Vesuvius is the most feared, following the devastation caused by recent plinian eruptions. A large proportion of the population of the Campania region (*Level 1*) is exposed. Preparedness is high, vulnerability maps are available, procedures for the evacuation of exposed people are prepared and simulation exercises are frequent. However, tools for the early detection of eruptions and for alerting people remain highly experimental, mainly due to the fact that eruptions are infrequent, although more reliable tools are currently under development through international cooperation.

- Mount Etna has effusive eruptions making the events at ground level easier to control. There is a good deal of experience of very recent eruptions.

29 Courtesy of the Italian Department of Civil Protection.

30 Courtesy of the Italian Department of Civil Protection.

Table 2.1: Risk exposure and organisation in Italy.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	tornadoes	sea surges	tsunamis	volcanoes	earthquakes
level dealing with event	Level 0	Level 0	Level 0	Level 1	Level 1	Level 1	Level 1	Level 0
degree of impact	high	high	high	low	medium	low	high	high
<b>preparedness</b>								
prediction system	working at Level 0 and Level 1	not applicable	working at Level 0 and Level 1	no	working at Level 0	working at Level 0 for a minor part of the coastal areas	working at Level 0 and locally for active volcanoes	not applicable
vulnerability maps	existing	existing in a few Level 1 areas	existing in a number of Level 1 areas	no	no	existing in only a few islands	locally for active volcanoes	existing
<b>alerts and warnings</b>								
procedures	working from Level 0 to Level 3	not applicable	working from Level 0 to Level 3	no	working at Level 0	no	research ongoing	not applicable
efficiency	upper-medium	low	upper-medium	not measurable	medium	not measurable	upper-medium	not applicable
public perception	upper-medium	no	upper-medium	not measurable	not measurable	not measurable	upper-medium	not applicable
<b>response and search and rescue</b>								
procedures	working from Level 0 to Level 3	locally designed	working from Level 0 to Level 3	locally designed	event driven	no	event driven	working at Level 0
efficiency	high	low	high	not measurable	medium	not measurable	upper-medium	high
public perception	upper-medium	no	high	not measurable	not measurable	not measurable	upper-medium	upper-medium

- Eruption events are managed at *Level 0*, due to the large quantity of resources required and the high calibre of professionals involved. Recent technological developments facilitating the monitoring of the ash plume and its impact on the civil airline industry is managed at *Level 0*.
- Mount Stromboli is very active and the recent collapse of its slopes into the Tyrrhenian Sea produced minor tsunamis. However, the event was managed at *Level 0* and timely alert messages were diffused to nearby islands and civil navigation.

Preparedness tools, alert and warning procedures and mitigation activity are all effective, and public perception of Civil Protection actions in this field is high. Risk from volcanic activity is significant in large parts of Italy and a great deal of investment has been channelled into research and other risk reduction activities.

The main concepts are summarized in column 7 of Table 2.1.

There is a risk of earthquake activity throughout Italy. Because ex-post warnings are impossible, the organisation of Civil Protection with regard to earthquakes is quite different from that of other natural hazards and involves only preparedness and search and rescue.

Preparedness is developing in two directions. The first deals with efforts to promote resilience through the development of seismic building codes for new buildings and codes for the restoration and rehabilitation of existing ones. National seismicity maps have been recently updated in order to enforce these new national codes and regulations. The second involves the evaluation of vulnerability and concerns predicting the response of large systems of buildings through the development of



models. Using such models it is possible to estimate the probable degree of damage caused by an earthquake once its magnitude has been determined.

With such measures in place, the quantity of search and rescue resources required can be immediately calculated, allowing the Head of the Department of Civil Protection to take the lead and allocate appropriate intervention forces corresponding to the severity of the event. Frequently, earthquake mitigation involves the *Level 0* mobilization of volunteers from all over the country. Such mobilizations can be critical to the efficient management of the emergency situation and, along with simulation exercises, help ensure that Civil Protection organisations are ready to deal with events of any magnitude.

Civil Protection systems are rated as efficient and perceived by the public to be good, as can be seen in the final column of Table 2.1.

Technological hazards are diverse and multifarious. They include hazards due to nuclear waste or pollution, industrial accidents, transport of dangerous substances, communication and technological network failures, dam collapse and even terrorist actions. Collectively, their impact is potentially as large as that of natural hazards and their sheer diversity mean that frequently very specific risk reduction procedures are required to manage them, which can pose a major challenge for Civil Protection authorities.

Unlike with natural hazards, where sophisticated management systems are already in place to deal with the impact of disasters, the diverse challenges posed by technological hazards often necessitate a more bespoke approach. To deal with the risks posed by specific technological hazards, the Civil Protection system relies on its capacity to rapidly coordinate different *Level 0* and *Level 1* agencies, administrations and experts in the field. Certain procedures involved in the management of technological hazards are under restricted access and are not diffused to the public.

### 2.2.3 Human resources and costs

There is an important distinction to be made regarding the use and quantity of human resources involved in Civil Protection between ‘times of peace’ and ‘times of emergency’. Table 2.2 demonstrates how, during times of emergency, the numbers of people involved in Civil Protection can expand by a very large factor. In times of peace a total of around 1,600 people are involved in Civil Protection, something like 0.0041 per cent of the active population, but this can mushroom to a potential 3.85 per cent of the active population in very large emergencies, although it is most unlikely in a single catastrophic event that they would all be engaged. Only emergencies of the magnitude of the Arno inundation in Florence, in 1964, require such enormous numbers. Very large emergencies initially involve mobilization of the mobile column<sup>31</sup>, followed by the Fire Brigade, Forest Service, Army, police, *Carabinieri* and volunteers. Civil Protection outside Italian territory frequently involves the Navy, Air Force and Army, in addition to volunteers.

Costs are summarized in Table 2.3. Columns one and two contain the costs of public servants and private contractors permanently involved in Civil Protection. Columns three and four show the costs of the Forest Service and Fire Brigade during emergency periods, expressed as percentages of their total annual budgets. Column five summarizes the cost of equipment, including the fleet of aircraft used in fire-fighting operations (this is a major cost, amounting to approximately €140 million during the 2007 fire season). Column six indicates the average annual cost of Government subsidies to pay for the cost of reconstruction activities following previous catastrophes (this currently stands at about €1.1 billion per year at *Level 0*, although it should be noted that there have been unusually few major emergencies in the past few years and this figure may be artificially deflated). The third row indicates the cost of applied research and technological development directly supported by the Italian Civil Protection sector. This includes the application of state-of-the-art models, procedures and tools. The figures include an itemised cost of research and development.

31 The mobile column is comprised of national and regional components, namely the Fire Brigade, regional civil servants and volunteers, with Level 0 and Level 1 equipment.

Table 2.2: Human resources involved in Civil Protection in Italy.

HUMAN RESOURCES				
Level 0				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	600 <sup>(A)</sup>	500	100	600 + 2,000 <sup>(B)</sup>
% of the national active population	~0.0016	~0.0013	~0.00026	~0.0067
Level 1				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	1,000 <sup>(A)</sup>	750	250	600 + 2,000 <sup>(B)</sup> + 20,000 <sup>(C) (D)</sup> + 25,000 <sup>(E) (D)</sup> + 1,500,000 <sup>(F) (D)</sup>
% of the national active population	~0.0026	~0.0019	~0.0006	~ 3.85

Notes to Table 2.2:

- (A) About 50% are PhD-level or graduates and 50% are high school diploma holders.
- (B) Fast response columns of Civil Protection, made up of members of the Fire Brigade, regional civil servants and volunteers.
- (C) Fire Brigade detachments distributed over the country, Army components, Police components and Carabinieri.
- (D) Such a figure is the maximum at the country level. It is quite improbable that in a single catastrophic event they are fully engaged.
- (E) Forest Service detachments distributed around the country (public servants within the Ministry of Agriculture/Regional Governments). Such a figure is the maximum at country level. It is quite improbable that in a single catastrophic event they are fully engaged.
- (F) Organised Volunteers. Most are distributed in detachments all over the country. Such a figure is the maximum at country level. It is quite improbable that in a single catastrophic event they are fully engaged.

The average annual cost of the Italian Civil Protection system is about €1.7 billion, which represents around 0.13 per cent of the annual GDP. Two thirds of this total is used to repay costs accrued during previous catastrophes.

## 2.2.4 – Civil Protection and society

There is a multi-faceted approach to the development of Civil Protection education at all levels, although the main focus is on the development of expert knowledge at graduate and post-graduate level. Both undergraduate and graduate courses in environmental engineering are offered by most faculties of engineering, with several, especially at post-graduate level, specialising in the management of natural and technological hazards.

Continuing education programmes for civil servants and professionals are also offered, such as those of the research foundation established by the Department of Civil Protection in conjunction with the University of Pavia on seismic risk, or those of the research foundation established together with the University of Genoa on hydro-meteorological risk.

The risk reduction message is yet to be fully and formally embedded into school curricula at primary level, with only experimental programmes so far conducted and no national coverage.

It is worth mentioning a recent initiative launched for the public at large by the Department of Civil Protection. *Italian Earthquakes* is an itinerant show travelling from region to region with exhibitions of images of past earthquakes, tools for resilience-building and retrofitting and many other devices to allow visitors to feel the type of simulated shocks that a real earthquake produces.

From the early 1980s and the start of the Civil Protection project Italy has pursued a policy of investing in applied research and technological innovation. Three research groups were initially formed to focus activities on hydro-meteorological, volcanic and seismological hazards and the risks they posed. They were given the task of:

- Researching past events and forming a quantitative archive.
- Defining possible scenarios of event and risk and identifying observable precursors of such scenarios.

Table 2.3: Average annual costs of the Civil Protection system in Italy.

ANNUAL COSTS							
Level 0							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of Fire Brigade due to activities during 'emergency periods'	percentage cost of Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	~27	~4	~20	~18	~220 <sup>(A)</sup>	~1,100	~1,390
% of the national GDP	~ 0.02					~ 0.08	~ 0.1
Level 1							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	cost of equipment, technologies and emergency assets		average annual cost of post-emergency recovery	total funding for Civil Protection	
euros (millions)	~45	~9	~80 <sup>(B)</sup>		~130	~265	
% of the national GDP						~0.02	
research and development(c)							
	Investment in universities, research agencies and/or organisations working for Civil Protection (network of competence centres)		maintenance for universities, research agencies and/or organisations working for Civil Protection (network of competence centres)		public bodies or private companies supplying hardware and software		
euros (millions)	~10		~20		~20		

Notes to Table 2.3:

- (A) This cost includes Level 0 transportation, communications and logistics. Organisational costs and cost of emergency phase includes about €140 million for the fleet of fire-fighting aircraft.
- (B) This cost includes Level 1 transportation, communications and logistics. Organisational costs and cost of emergency phase includes regional fleet of fire-fighting helicopters.
- (C) This cost is included within the operational costs at Level 0 (mainly) and Level 1.

- Defining procedures for assessing vulnerability of different areas of the country and warning procedures where possible.
- Defining codes and rules for land-planning and new buildings, rehabilitating existing buildings and redesigning urban areas at risk.

The conclusions the research groups arrived at formed the foundations upon which present-day Civil Protection in Italy was built.

Today, university departments and research institutes enjoy positive international standings and scientific reputations, frequently participating in international research projects, both EU- and non-EU funded. The three research groups were recently evolved into a network of so-called competence centres.

About four per cent of the annual Civil Protection budget is spent on research and development. The research network includes the Italian Space Agency, which recently initiated, along with the Consortium for Earth Observation COS(OT), the OPERA project to monitor major hazards via satellite.

In terms of cross-border activities, the Department of Civil Protection (*Level 0*), and a number of Civil Protection organisations at *Levels 1* and *2*, are involved in cross-border cooperation activities in a number of countries. These actions are frequently coordinated at central level, such as the Rainbow Operation in Albania, but they are also, less frequently, managed only at central level, such as the search and rescue operations in South East Asia following the tsunamis in the Indian Ocean, or those in Turkey following a large earthquake in 2002. More recently, Italian fire-fighting aircraft were deployed in Greece and Albania during the 2007 season of forest

fires. Funds for such operations come either directly from Department budgets, or through public subscriptions.

An agreement recently signed between France, Greece, Italy and Spain covering forest fires resulted in an EU-scale simulation exercise in April 2008.

Cross-border operations are managed by the Office for International Cooperation of the Department of Civil Protection, upon agreement with the Minister for Foreign Affairs as funding agency.

### **2.2.5 Areas of excellence in the Italian Civil Protection system**

A number of points of excellence emerge from this brief review of the organisation of Civil Protection in Italy, of which only the most significant will be mentioned.

- Clear chain of command: The President of the Council of Ministers, his delegated minister, or the Head of the Department of Civil Protection has the authority to take command of the management of an emergency situation and coordinate all the resources necessary to deal with it effectively.
- Investment in research and development: A substantial portion of the Civil Protection budget is spent on research and development, ensuring that tools, procedures and knowledge are constantly updated and upgraded.
- Decision-support centres: The *Centri Funzionali*, a network of *Level 0*-coordinated decision-support centres, work 24 hours a day to make real-time data available to the National Department of Civil Protection and regional governments, at *Level 1*. This facilitates the sharing of the decision-making process to determine when alerts should be issued and what actions should be taken. The upshot is that when an alert is issued there is no conflict between authorities at central and regional level.
- Public confidence: The system is perceived to be reliable and effective and this inspires public confidence in it.

## 2.3 Slovenia

### *Public perception of Civil Protection*

Protecting the population against the adverse consequences of disasters is both a duty and a function of national and local government in Slovenia. It is a function that also extends to the wider population in the form of the non-governmental organisation of civil society and it is one that has evolved in response to the changing perceptions of what constitutes risk in Slovenian society.

The origins of the Slovenian disaster management system stretch back to the late 1960s and follow the establishment of a Civil Protection system during the cold war. Although Civil Protection was initially intended to provide protection and rescue for people in war conditions, its focus was soon re-directed towards protection against disasters caused by natural or technological disasters, both in peace-time and war-time. Starting in the 1980s, Civil Protection units gradually evolved to become part of the rescue services, and Civil Protection commanders and their staff became a coordination body for all rescue services.

Legislation adopted after 1992 separated the system of protection against disasters caused by natural and other hazards from the defence system. The new system is unified and integrated and comprises all actors and means in this field. In accordance with the Resolution on the National Security Strategy of the Republic of Slovenia (2001)<sup>32</sup>, the disaster management system is one of the three sub-systems of the national security system.

In Slovenia, the term Civil Protection is nowadays used to indicate a specific sector of the whole disaster management system<sup>33</sup>. As mentioned above, the Slovenian disaster management system is organised as an integral interdisciplinary activity, and it merges professional and voluntary rescue services, humanitarian organisations,

research institutions and Civil Protection<sup>34</sup> and other organisations into one structure.

The disaster management system in Slovenia addresses the issues relevant to the broader concept of Civil Protection used in this review. The system is committed to a large number of tasks, from disaster risk reduction, preparedness and response to post-disaster recovery. Nevertheless, a great deal of attention is devoted to rescue and relief activities and much effort is spent in order to organise dynamic and efficient responses to emergencies. The emphasis of the system is also on self-protection and mutual assistance in case of disasters.

It should be noted that Slovenian citizens have a proud history of volunteering for fire-fighting, mountain rescue and other duties. It is a tradition that stretches back to the Austro-Hungarian period; the first volunteer fire-fighting organisation was established in 1869. Currently, over 40,000 people are operational volunteers.

### *Demography and administration*

Slovenia has a population of about 2 million people, giving it an order of magnitude of *Level 1* according to the classification used in this review.

At present Civil Protection is organised essentially at either State (*Level 1*) or municipal (*Level 3*) level and is based on a system of obligations between the State, the 210 municipalities, private companies and citizens. However, plans are under way for the introduction of *Level 2* administrative units and 13 local offices have already been established, although as yet they are little more than local branches of the State administration. They do, however, have competencies which enable them to administrate to a certain degree small areas of the country.

For the purposes of this review such local offices will be considered *Level 2* organisations.

32 Official Gazette of the Republic of Slovenia, 56/2001.

33 In Slovenia, disaster management system refers to a system of protection against disasters caused by natural and other hazards.

34 Civil Protection includes both operational units and operational leadership/coordination structures. Civil Protection units in Slovenia are those operational units committed to dealing with the effects of specific accidents, such as those involving chemicals, which cannot be managed by agencies such as search and rescue, other professionals or voluntary organisations. Operational leadership and coordination of rescue units and services in the event of accidents are carried out by Civil Protection commanders and their staff (organised at national, regional and local levels).

### 2.3.1 Legislation

It is defined by law (1994, 2006) that protection against natural and other disasters includes protection of people, animals, property, cultural heritage and environment. The main goal of the system is to reduce the number of disasters and the number of victims and other consequences of disasters.

Rescue and relief covers a range of different activities following events such as earthquakes and landslides, and includes emergency first aid, veterinary aid and humanitarian assistance. There is an obligation for citizens to exercise personal and mutual protection, which includes measures to prevent and mitigate the effects of natural and other disasters, including military and terrorist activities, so as to protect health, lives and property both at home and at work.

The most important laws governing the system of protection against disasters caused by natural or technological hazards are:

- The Protection Against Natural and Other Disasters Act<sup>35</sup>.
- The Fire Protection Act<sup>36</sup>.
- The Fire Service Act<sup>37</sup>.
- The Slovenian Red Cross Act<sup>38</sup>.
- The Recovery from the Consequences of Natural Disasters Act<sup>39</sup>.
- The Protection against Drowning Act<sup>40</sup>.

The Resolution on the National Security Strategy of the Republic of Slovenia<sup>41</sup>, adopted in 2001, is the basis for the five-year National Programmes of Protection against Natural and Other Disasters (2002 – 2007<sup>42</sup> and 2008 – 2013). The Programmes, orientated towards prevention,

have the aim of reducing the number of accidents and preventing or alleviating their consequences. Annual priorities are defined for each year.

On the basis of the above documents, the Doctrine on Protection, Rescue and Relief was adopted<sup>43</sup>, comprising common principles and perspectives concerning professional and operational guidance and organisation, and conduct of protection and rescue and relief efforts.

Control over the implementation of laws governing the protection system is executed by the constituent body of the Ministry of Defence: the Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters, and its branch offices.

### 2.3.2 Civil Protection structure

As previously outlined, the term 'Civil Protection' in Slovenia is used to describe particular operational units, addressing tasks relevant to intervention and rescue in emergencies linked to specific accidents that cannot be managed by other forces. In other words, Civil Protection refers here to a much narrower and more specific range of activities than is commonly understood elsewhere in the EU. In order to facilitate comparability with other EU case studies and SEE countries, the term Civil Protection will be used in connection with the Slovenian system as it is elsewhere in this review, in its wider meaning.

The Civil Protection system is based on the obligation of the State (*Level 1*) and municipalities (*Level 3*) to prevent or eliminate dangers and to implement prompt measures in case of disaster. Moreover, it is based on the obligations of 1) commercial companies, institutions and other organisations which, within the scope of their activities, are responsible for implementing emergency measures relating to the protection and rescue of people and property, and 2) individuals for the protection of themselves and their property. The State and municipalities are responsible for organising protection against natural and other disasters as a uniform and integral national system.

At *Level 1*, responsibilities are assigned to the Government, the Ministry of Defence and other ministries. In connection with the Ministry of Defence, administrative tasks and those involving specific expertise within the national

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35 Official Gazette of the Republic of Slovenia, 64/94, 51/2006.

36 Official Gazette of the Republic of Slovenia, 71/93, 3/2007.

37 Official Gazette of the Republic of Slovenia, 1993, 2005.

38 Official Gazette of the Republic of Slovenia, 7/93.

39 Official Gazette of the Republic of Slovenia, 75/2003.

40 Official Gazette of the Republic of Slovenia, 42/2007.

41 Official Gazette of the Republic of Slovenia, 56/2001.

42 Official Gazette of the Republic of Slovenia, 44/2002.

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43 Official Gazette of the Republic of Slovenia, 64/94, 33/00, and 87/01.

disaster management system, especially in the areas of preparedness and response to disasters, are carried out by the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief, which was established in 1991 and is a constituent body of the Ministry of Defence.

The central office of the Administration is in the capital city Ljubljana; education and training of fire-fighters, Civil Protection and other rescue units are carried out in the Training Centre for Civil Protection and Disaster Relief at Ig, near Ljubljana, and its sub-centres in Sežana and Pekre. The Administration has 13 regional offices covering designated areas of Slovenia. The central office comprises the following organisational units:

- Office for Prevention and Operational Affairs.
  - Sector for Monitoring and Alarm-raising, including National Emergency Notification Centre.
  - Sector for Planning, Operational Affairs and Damage Assessment.
  - Sector for Prevention, Fire Protection and Fire-fighting.
- Office for Education and Training.
  - Sector for Education and Training.
  - Training Centre for Civil Protection and Disaster Relief, including Fire-Fighting School.
- Sector for Informatics and Communication.
- Department for General Affairs.
- Department for International Cooperation and EU Affairs.

The Administration is charged with the following tasks:

### Prevention:

- protection against fire, drowning, avalanches and explosive ordnance disposal;
- specific tasks related to spatial planning.

### Preparedness:

- assessing risks and drafting national emergency response plans;
- organising and implementing an autonomous system of monitoring, notification and warning;
- providing education and training for protection and rescue units and services, as well as for the population;

- organising and equipping the national protection and rescue units and services;
- maintaining the national reserves of material assets for protection, rescue and relief purposes.

### Response:

- coordinating response to major disasters;
- assisting local communities in emergency response;
- providing support to the Civil Protection Commander of the Republic of Slovenia and his/her staff during major emergencies;
- providing basic conditions for life.

### Recovery:

- assessing the damage caused by disasters.

The Administration gives special emphasis to development projects and research activities. It is also responsible for coordinating and implementing international cooperation of the Republic of Slovenia in the field of disaster management with neighbouring and other countries, as well as with regional initiatives and international organisations and the EU. It provides and coordinates rescue assistance in the event of major disasters abroad.

A key factor in the homogenization of the Civil Protection sector in Slovenia is the adoption of the international emergency call number 112. The process involved in adopting this number was begun in 1995<sup>44</sup>, even before the country's accession to the EU, and the number was launched nationally in 1997. The single number replaced the previous system, which used three different emergency numbers.

At *Level 1*, and the hub of the emergency number 112 system, is the National Emergency Notification Centre. Its main tasks are the monitoring of events and the issuing of alerts and warnings when emergencies occur. The centre receives meteorological information via an external service and compiles a bulletin in which

44 The introduction of the European emergency call number is regulated by:

- 91/396/EEC: Council Decision of 29 July 1991 on the introduction of a single European emergency call number;
- Directive 98/10/EC of the European Parliament and of the Council of 26 February 1998 on the application of open network provision (ONP) to voice telephony and on universal service for telecommunications in a competitive environment;
- Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

warning information is inserted, when necessary. Such information is diffused to the public via the media, including television, radio, the internet and teletext. Moreover, the centre is responsible for the activation of sirens to raise the alarm in case of emergency<sup>45</sup>. The centre is an important tool for information sharing, with reference to both incoming emergency calls and information relevant to the geographical area to which the calls (and thus the emergencies) refer. The National Emergency Notification Centre is also a Slovenian 24/7 contact point for international organisations in the area of Civil Protection, and for international mechanisms for coordination of disaster relief assistance, including the EU Civil Protection Mechanism.

The 13 regional offices are the reference points of the Administration for specific regions of the country, defined on the basis of their characteristics with relation to disasters caused by natural and other hazards, and represent *Level 2* of the Slovenian Civil Protection system. Each office contains a Regional Emergency Notification Centre (connected to the National Emergency Notification Centre) and a warehouse. The *Level 2* Notification Centres respond to emergency 112 calls and can activate all protection and rescue units, including the special units of the Fire Brigades for so-called technical rescuing (following emergencies such as road traffic accidents, fires in tunnels, accidents with chemicals, and so on).

The centres are directly connected to the *Level 1* National Emergency Notification Centre, which intervenes in the management of information flow whenever an emergency of *Level 1* is recognised and State coordination is required. In each of the centres there is a powerful Geographical Information System called GIS\_UJME, with more than 120 data layers, which is especially important for search and rescue purposes. Operational since 2007, the system allows the exact location of the caller to be identified when using a stationary telephone and the identification of the transmitter the caller used when using a mobile telephone. In 2009 a so-called 'WAP 112 call' solution was introduced, which enables the hearing impaired to use the 112 single European emergency call number.

At *Level 3*, the municipalities operate and manage the system of protection and rescue independently in their

areas. Professional protection, rescue and relief tasks are carried out by the municipal administration and local protection and rescue units and services. The responsible authority at *Level 3* is the mayor.

Protection, rescue and relief units and services are organised at both municipal and national level. There are three types: voluntary, professional and Civil Protection units and services. Most exist at local level. These units and services involve around 5 per cent of the total population of Slovenia, the majority of which carries out tasks voluntarily or as part of national service. The main rescue service is the Fire Rescue Service.

Protection, rescue and relief units and services at national level are:

- voluntary: mountain rescue service, cave rescue service, rescue scuba divers, rescue dog handlers, scouts, Red Cross and Caritas;
- professional: national public services, i.e. medical service, ecological laboratory with mobile unit, mobile meteorological unit, mine rescue units and contractors;
- Civil Protection: rapid response unit, NBC protection unit, technical rescue unit, explosive ordinance disposal unit and support services.

Rescue units and services at the municipal level are:

- voluntary: fire-fighting units, rescue dog handlers, rescue scuba divers, scouts, radio amateurs and the local Red Cross organisation etc.;
- professional: municipal fire service, emergency medical service, public services and other contractors;
- Civil Protection: first aid, urban search and rescue, NBC decontamination, air-raid shelter maintenance and logistics etc.

Operational leadership of Civil Protection and other protection and rescue units and services is managed as a uniform system at *Level 1*, *Level 2* and *Level 3*. Leadership is by the Civil Protection commanders, their staff and incident commanders<sup>46</sup>. At *Level 1* is the Civil Protection Commander of the Republic of Slovenia, and his or her staff; *Level 2* Civil Protection commanders and their staff are appointed by the Government; and *Level 3* Civil Protection commanders and their staff are appointed by mayors. *Level 3* Civil Protection commanders are

45 Specific signals emitted by the sirens correspond to specific behaviour that the population has to observe; explanatory panels should be exposed in all main buildings and meeting areas.

46 Protection Against Natural and Other Disasters Act (1994, renewed in 2006), Official Gazette of the Republic of Slovenia 64/94, art. 81.



accountable to mayors and to commanders at *Level 2*, while *Level 2* Civil Protection commanders are accountable to the *Level 1* Civil Protection Commander, who in turn is directly accountable to the Government. Civil Protection Headquarters provides support to the Civil Protection Commander in managing emergency responses<sup>47</sup>. Members of Civil Protection Headquarters are representatives of key ministries (or departments of local administrations at municipal level), experts from different fields or heads of different protection and rescue units.

In cases of minor accidents, commanders of individual units command the response. The management of the response in larger accidents or disasters is carried out by the Civil Protection commanders and their staff (*Levels 1 to 3*). The Civil Protection commander may decide to designate incident commander(s) to coordinate rescue responses at each individual accident site. In larger accidents the Civil Protection commander and the incident commander both hold additional authority, which enable them to take action to protect people and carry out rescue activities<sup>48</sup>.

Slovenia is threatened by numerous disasters caused by the impact of natural hazards, including earthquakes, floods, landslides, storms and fires. The greatest threat to the environment comes primarily from accidents involving dangerous substances. Contemporary and historical experience has shown that appropriate attention must be given to unexpected population migrations, acts of terrorism and military threats.

Most of the information reported in the following section is taken from the National Report and Information on Disaster Reduction<sup>49</sup>.

Floods are a threat to more than 300,000 hectares of land, or approximately 15 per cent of the total territory, and the regions prone to flooding are home to more than 600,000 people; about 30 per cent of the total population.

However, the research and monitoring of flood risk is well developed and the public is primed about what to do in the event of flooding through a system of information sharing and training. This ensures that effective measures can be swiftly implemented when the flood risk is high.

Risk assessments are made by analysing the type and character of surface water and the intensity, duration and frequency of previous flooding. Flood maps are available grading floods by their return periods and magnitude, from frequent floods with return periods of five years, to catastrophic floods with return periods of 50 years or more. Emergency response plans are developed for floods at *Level 1*, *Level 2* and *Level 3*. Column 1 of Table 2.4 contains a summary of this information.

Landslides threaten approximately 7,000 km<sup>2</sup>, or about one third of the territory. Only the Primorska and Dolenjska karstic regions do not suffer from the risk of landslides. Approximately 1,400 landslides have been recorded. The specific preparedness measures in connection with landslides include the research and monitoring of landslide risk and the training of technical units. Emergency response plans for landslides are developed at *Level 2* and *Level 3*. Column 2 of Table 2.4 contains a summary of this information.

Forest fires are the most frequent disaster hazard in Slovenia, affecting mainly the Notranjska karstic region. Of the 2,700 fires reported on average per year between 1987 and 1997, 1,080 were classified as 'outdoor' fires, the others being 1,337 'building' fires and 295 'vehicle' fires. March, April, July and August are the months with the highest incidence. The cause of most fires was either negligence or misconduct.

The specific preparedness measures in connection with fires include monitoring and studying fire risk and increasing public awareness of the hazard to facilitate the effective implementation of emergency procedures in the event of a fire. Mechanisms are in place to maintain an appropriate level of readiness and specific training programmes are organised for the Fire Rescue Service. Column 3 of Table 2.4 contains a summary of this information.

Slovenia is situated in a seismically active area and the risk from earthquakes is real across most Slovenian territory. The most active zones are the Gorenjska-Ljubljana, and Dolenjska-Notranjska-Bela Krajina.

47 Protection Against Natural and Other Disasters Act (1994, renewed in 2006), Official Gazette of the Republic of Slovenia 64/94, art. 87.

48 Protection Against Natural and Other Disasters Act (1994, renewed in 2006), Official Gazette of the Republic of Slovenia 64/94, art. 84-85.

49 National Report and Information on Disaster Reduction, prepared by the Administration for Civil Protection and Disaster Relief of the Ministry of Defence of the Republic of Slovenia for the World Conference on Disaster Reduction (Kobe-Hyogo, Japan, 18-22 January 2005).

Table 2.4: Risk exposure and organisation in Slovenia.

NATURAL HAZARDS	Floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with impact	Level 1	Level 2	Level 1	Level 1
degree of impact	high	high	high	high
<b>preparedness</b>				
prediction system	working at Level 1	not applicable	-	not applicable
vulnerability maps	existing at Level 1 to Level 3	existing at Level 2 and 3	existing at Level 1 to Level 3	existing at Level 1 to Level 3
<b>alerts and warnings</b>				
procedures	existing	Level 1	-	not applicable
efficiency	medium <sup>(A)</sup>	medium <sup>(A)</sup>	-	not applicable
public perception	upper-medium	upper-medium	-	not applicable
<b>response and search and rescue</b>				
procedures	working from Level 1 to Level 3	working at Level 2 and Level 3	working from Level 1 to Level 3	working at Level 1 to Level 3
efficiency	high	high	high	high
public perception	upper-medium	upper-medium	upper-medium	upper-medium

Notes to Table 2.4:

(A) This evaluation is the result of a compromise between two considerations. Firstly, Slovenian territory is covered by a system of 1,600 sirens, partially synchronised with a common monitoring, notification and warning system. However, secondly, the development of the full system is yet to be completed. The use of such devices for alerting people may not represent the best way for disseminating understandable warnings to the population.

The towns most at risk include Idrija, Ljubljana, Krško, Tolmin, Ilirska Bistrica and Litija. Over 650,000 citizens, or 33 per cent of the total population, live in areas considered at risk of earthquakes of magnitude VIII or IX on the MCS scale.

Each year, the ground in Slovenia is shaken by an average of 10 weak-to-moderate shocks, although in the recent past several very destructive earthquakes have struck with epicentres either on the territory of present-day Slovenia or in its vicinity. According to historical sources, one of the most powerful earthquakes ever struck Idrija in 1511. A destructive earthquake in 1895 caused a great deal of damage in the capital Ljubljana, which together with buildings in some surrounding areas had to be completely rebuilt.

The management of risk reduction with regard to earthquakes focuses on measures calculated to mitigate the effects of future disasters. The two most important

are the enforcement of building regulations to improve resilience and research and monitoring of seismic activity. Research into the resilience of the existing building stock shows that large numbers of residential and industrial buildings, infrastructure assets and other facilities require the retrofitting of resistance measures to improve structural integrity. This means that preparedness efforts to bolster rescue and relief operations need to be intensified and appropriate mechanisms for the effective management of earthquake disasters put in place from *Levels 3 to 1*. Column 4 of Table 2.4 contains a summary of this information.

The main technological hazards affecting Slovenia are those associated with chemical and industrial accidents, including nuclear accidents and other radiological threats.

The main piece of legislation covering industrial accidents is the Seveso II Directive 96/82/CE,

which was transposed into Slovenian legislation in 2002<sup>50</sup>. The principal specific preparedness measures include warnings issued to the public in the event of an industrial accident and regulations requiring all commercial enterprises and municipalities dealing with dangerous substances to have in place appropriate emergency plans. Special units have to maintain the appropriate level of readiness.

There is one nuclear power plant in Slovenia, situated on the left bank of the Sava River around 3 km from the town of Krško, 70km south-east of Ljubljana and 35 km north-west of Zagreb (Croatia). Within a 1,000 km radius there are 50 nuclear power plants; of these, 32 are within 500 km of Slovenia.

Risk reduction measures in connection with nuclear hazards include:

- Observing international security and technical regulations for the operation of nuclear power plants.
- Radiological monitoring.
- Cooperation with international institutions to provide early warning in the event of nuclear power plant accidents in other countries.

Specific preparedness measures for nuclear hazards include:

- Notifying the population.
- Ensuring that appropriate emergency plans are in place at all commercial organisations at Levels 1 to 3 which deal with radioactive substances to ensure that effective measures can be implemented in the event of an accident<sup>51</sup>.
- Training of special units and regular exercises according to the emergency response plan.

### 2.3.3 Human resources and costs

The number of people permanently employed in Civil Protection duties at *Levels 1* and *2* is approximately 330. During emergency events this number can increase to roughly 2,700 if *Level 1* and *Level 2* national protection and rescue units and Civil Protection commanders and their staff are mobilized. This total includes staff of the National Emergency Notification Centre and the 13 *Level 2* Notification Centres. Each *Level 2* centre has about 10 staff.

At *Level 3*, the numbers of people involved with Civil Protection can rise dramatically during emergency events if the large reserve of volunteer fire-fighters is mobilized. Of the total 60,000 people potentially involved in Civil Protection during emergencies, some 70 per cent are volunteers (a figure planned to be increased to 88 per cent in the near future); 5 per cent are professional rescuers; and the remaining 25 per cent work in operational units that intervene in specific types of accidents (this percentage is planned to be gradually decreased).

A summary of the findings can be seen in Table 2.5.

Disaster management activities are financed through the national and municipal budgets, and through insurance payments and other funds contributed by commercial companies, institutions and other organisations. Every year the Government of Slovenia allocates approximately 0.4 per cent of the national budget to the disaster management system. Municipalities are required to earmark 3 per cent of their annual budgets to Civil Protection, although the average actual figure stands at just 2.1 per cent. Fire risk reduction activities are partly financed from a separate fire fund, which is generated from a tax on fire insurance. Currently, 5 per cent of all fire premiums are used for fire risk reduction activities.

A summary of this information can be found in Table 2.6.

50 Environmental Protection Act – Decree on the reduction of risk to the environment caused by major accident hazards involving hazardous chemicals (Uradni list RS [Official Gazette of the Republic of Slovenia] No 46/2002) and; Protection Against Natural and Other Disasters Act – Decree on the subject matter and compilation of emergency response plans (Uradni list RS, No 3/2002, 17/2002) and; Decree on the organisation and operation of monitoring, information and warnings (Uradni list RS, No 45/1997 and 5/2000).

51 The nuclear incident of 4 June 2008 at the Krško nuclear power plant, which tripped the EU's 'Ecurie' early warning system for nuclear emergencies, was a good example of preparedness.

Table 2.5: Human resources involved in Civil Protection in Slovenia.

HUMAN RESOURCES				
Level 1 and Level 2				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	330 <sup>(A)</sup>	330	2 <sup>(B)</sup>	330 + 1,600 <sup>(C)</sup> + 100 <sup>(D)</sup> + 695 <sup>(E)</sup>
% of the national active population(F)	0.024	0.024	-	~0.195
Level 3				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	180 <sup>(G)</sup>	180 <sup>(G)</sup>	no information available	180 <sup>(G)</sup> + 950 <sup>(H)</sup> + 15,000 <sup>(I)</sup> + 42,000 <sup>(J)</sup>
% of the national active population(F)	0.013	0.013	-	~4,15

Notes to Table 2.5:

- (A) Personnel of the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief at Level 1 and Level 2.
- (B) The Mine accident rescue unit (Premogovnik Velenje d.d.) and Protection and rescue unit for accidents with chlorine and other corrosive substances (TKI Hrastnik d.d) are co-financed by the State. Additionally, some public institutes with special knowledge are co-financed by the Administration for Civil Protection and Disaster Relief.
- (C) Members of Level 1 and Level 2 Civil Protection headquarters and members of the Level 1 Rapid Reaction Unit.
- (D) Professional rescuers employed in public institutes.
- (E) Volunteers: mountain rescuers (430), dog handlers (150), divers (60) and cave rescuers (55) – co-financed by the State.
- (F) The active population of Slovenia, namely people aged from 14 to 64 years, is approximately 1 million.
- (G) Personnel in Level 3 administrations involved in protection and rescue activities.
- (H) Professional fire fighters.
- (I) Civil Protection (in the Slovenian context) members.
- (J) Volunteers (mainly voluntary fire-fighters).

Table 2.6: Average annual costs of the Civil Protection system in Slovenia.

ANNUAL COSTS							
Level 1 and Level 2							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of Fire brigade due to activities during 'emergency periods'	percentage cost of Forest service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
% of the national GDP	~ 0.4% of the State budget						
Level 3							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	cost of equipment technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection		
% of the national GDP	3% of the budget of municipalities						

### 2.3.4 Civil Protection and society

In terms of education, training and research, most personnel involved in the disaster management system have qualifications from the regular education system. Exceptions to this include professional fire-fighters, who are educated through a professional fire-fighting training programme.

The State and municipalities train Civil Protection personnel, using programmes approved by the minister responsible for protection against natural and other disasters. The training for members of voluntary services and units is carried out by the voluntary organisations themselves.

The education of professional fire-fighters, training of Civil Protection personnel, and the organisation of international courses on disaster management all take place at the Training Centre for Civil Protection and Disaster Relief, which is the main national educational and training institution for this subject in Slovenia<sup>52</sup>. Other educational institutions can perform training in this field if they acquire authorisation from the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief.

Education of the public about personal and mutual protection in case of a disaster is an obligation of the State and municipalities<sup>53</sup>. It is executed through media campaigns, the publication of literature and through the extension of programmes for pre-school and elementary-school children.

Approximately 100 research and development projects concerning protection against natural and other disasters, and 20 projects on protection against fire, were implemented in Slovenia from 1992 to 2007. The promotion of research and development has both a legal and political imperative, with legislation<sup>54</sup> and the National Programme of Protection against Natural and

Other Disasters<sup>55</sup> providing a framework for its growth. Projects provide practical solutions on how to improve the disaster management system and include subjects ranging from the use of the GIS to information support and fire-fighting in mountainous areas.

Research and development projects on disaster management are financed from a variety of sources, including the national research programme Knowledge for Security and Peace 2002–2010, the technological programme Technology for Security and Peace 2006–2012, fire tax funds, the Administration for Civil Protection and Disaster Relief and also funds from other ministries.

In terms of cross-border activities, the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief has signed multiple agreements for bilateral cooperation and joined several regional initiatives. Bilateral agreements have been signed and cooperation conducted with Austria, Croatia, the Czech Republic, Hungary, Poland, the Slovak Republic, the Russian Federation and Italy. In addition, intensive bilateral cooperation, particularly in the field of education and training, is ongoing with France, Sweden and the United States of America.

Cooperation with neighbouring countries of SEE is also ongoing, including with Albania, Bosnia and Herzegovina, Bulgaria, the FYR of Macedonia, Romania, Serbia and Montenegro. Slovenia is also very active in the regional DPPI SEE and, together with Croatia, led the Disaster Management Training Programme, in which more than 700 participants from SEE were educated and trained in disaster management between 2002 and 2007.

It is worthy of note that Slovenia took over the Presidency of the Council of the European Union from January to June 2008. During this time, the Presidency policy priorities in the field of Civil Protection were the EU response to disasters, cooperation within the Western Balkans and cooperation with international organisations.

During the term, two meetings were organised in Slovenia: a seminar on strengthening cooperation with candidate countries and Western Balkan countries in the field of Civil Protection, in Bled, in February; and a meeting of

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52 Protection Against Natural and Other Disasters Act (1994, renewed in 2006), articles 113.

53 Protection Against Natural and Other Disasters Act (1994, renewed in 2006), articles 110.

54 Protection Against Natural and Other Disasters Act (1994, renewed in 2006), article 40.

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55 National Programme of Protection against Natural and Other Disasters for the period 2002 – 2007.

the Directors-General for Civil Protection, which was a joint session with candidate countries and Western Balkan countries, in May.

### **2.3.5 Areas of excellence in the Slovenian Civil Protection system**

There are two principal areas of excellence that emerge from this review of the Slovenian Civil Protection system:

- Detailed planning: accurate and detailed emergency response plans are in place to manage a number of disaster scenarios, with nine separate types of disasters identified and *Level 1* plans drawn up for each. The emergency response plan covering earthquakes is especially advanced, with tasks and responsibilities for each level of the Civil Protection mechanism clearly identified and articulated.
- Public participation: Slovenian Civil Protection involves people at all levels and information disbursement is good, using a variety of media sources. There is good use made of radio and television and, although the notification via sirens is of questionable value, the highly visible and widespread poster campaign advising people about warning signals and how to respond to them is worthy of note. In addition, procedures and directions for citizen response to any kind of disaster which might occur in Slovenia are published on the home page of the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief. Specific activities, including the national artistic and literary competition on a selected disaster theme for pre-school and school children, are organised every year. The efforts in the area of education and training related to 112 single European emergency call number have been acknowledged by the European Emergency Number Association.
- Use of new technologies: integrated information and communication systems are used, including geographical information systems, in particular in the Emergency Response Centres. This includes the introduction of the WAP 112 call solution, which enables people with hearing difficulties to communicate with the operators in 112 emergency response centres<sup>56</sup>. A WAP 112 call represents the first step towards multimedia support of 112 calls, which the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief plans to upgrade with video and other services in the near future.
- Capacity sharing: one of the Slovenian priorities is cooperation with countries in SEE and the Western Balkans, both on a bilateral basis and through the DPPI SEE, with the aim of improving their capacities for coping with disasters and supporting regional cooperation. Activities to support the European course of the Western Balkan countries in the field of Civil Protection and enhance their cooperation with the European Union, initiated under the Slovenian Presidency of the EU in 2008, have also been continued.

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<sup>56</sup> In line with EU Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

## 2.4 Sweden

### *Public perception of Civil Protection*

The perception of Civil Protection in Sweden changed profoundly following the 2005 tsunami. The change was prompted by public concern over what were seen as capacity gaps in the existing Civil Protection mechanisms, particularly with reference to delays in the system of humanitarian aid disbursement. There was also concern over the way in which operations were conducted to rescue Swedish citizens abroad. A new system based on clear demarcation of roles and responsibilities, rather than cooperation, was demanded.

In response, the Government has initiated a deep-rooted structural reform of the Civil Protection system in an attempt to adapt it to meet both the existing demands for disaster risk reduction and the future challenges posed by the changing nature of hazards. A recent decision by the Prime Minister is testament to the Government's commitment in this area, establishing a counsellor group to offer decision-support over issues related to disaster prevention and management.

On one level, the restructuring currently under way makes an accurate 'snap-shot' assessment of the Swedish Civil Protection system challenging, but on another it offers a valuable opportunity to examine a system in transition as it attempts to address the new challenges posed by the changing nature of risk.

### *Demography and administration*

Sweden has a population of about 9 million people, giving it an order a magnitude of *Level 1* according to the classification used in this review<sup>57</sup>. Swedish territory covers approximately 450,000 km<sup>2</sup> and is divided into 21 regional county administrations, called *Ian*, which have an order of magnitude of *Level 2*. Further territorial subdivision splits regions into 292 municipalities, with populations ranging from less than 10,000 to more than 100,000. In general, municipalities have an order of magnitude of *Level 3*.

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57 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

### 2.4.1 Legislation

National policy, strategy and legislation concerning risk reduction are constructed in such a way as to reflect Sweden's all-hazards approach to emergency management. This means that each *Level 3* authority must be capable of managing a spectrum of risks and crises, including disasters caused by natural hazards<sup>58</sup>.

Several acts define Swedish legislation concerning disaster risk reduction. The most relevant are:

- The Seveso Act, based on the EU directive covering industrial sites which represent a major accident hazard;
- The Environmental Code, addressing the matter of accidents induced by human interference;
- The Planning and Building Act, giving responsibility to Level 3 authorities for the control of land and water use.
- The Land Code, defining property legislation and the consequence of risks on neighbouring properties.
- The Water Directive, which aims to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. It will ensure all aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands meet 'good status' criteria by 2015. It is based on an EU directive requiring that Member States establish river basin districts and, for each of these, a river basin management plan.
- The Flooding Directive, aimed at reducing and managing the risks that floods pose to human health, the environment, cultural heritage and economic activity. It is based on an EU directive requiring that Member States first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. Such zones would then need to draw up flood risk maps by 2013 and establish flood risk management plans 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.
- The Civil Protection Act, the structure of which is based on three phases: emergency prevention, emergency response and post-response measures. The act defines the responsibilities of the individual, the municipality (*Level 3*) and the State (*Level 1*). Increased emphasis is placed on emergency prevention work; *Level 3* authorities are required to promote safety for people

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58 DG ENV - Member States' Approaches towards Prevention Policy - a Critical Analysis. Case Study Report – Sweden. Internal working document, January 2008.

in the municipality, share resources to promote prevention and support the capacity of the individual to meet his/her obligations under the act. *Level 3* authorities and *Level 1* emergency service authorities must, to a reasonable extent, investigate the cause and course of emergency events, and also evaluate how emergency response operations have performed.

## 2.4.2 Civil Protection structure

### Postscript

*A restructuring of the Swedish Civil Protection sector took place on 31 December 2008 in which the Swedish Emergency Management Agency, the Swedish Rescue Services Agency and the Swedish National Board of Psychological Defense were dissolved and a new consolidated body, the Swedish Civil Contingencies Agency (MSB), was established. It is responsible for matters related to Civil Protection, emergency management and civil defence. It was not possible, due to the advanced stage of the production process of this report, to fully document this restructuring.*

*The new agency's mandate spans the spectrum of threats and risks, from everyday accidents to major disasters and war. It will advance and support societal preparedness for emergencies, crises and disasters and contribute to reducing the consequences of serious events when they occur. The MSB will have an important role coordinating across and between various sector boundaries and areas of responsibility. This role is based on the principle of 'responsibility', under which individual actors retain their particular responsibilities and are coordinated by the MSB.*

The Swedish structure for civil emergency planning has undergone comprehensive change since 2002 following the enhancement of crisis management capabilities at *Level 3* and *Level 2*. The new structure is based on a holistic perspective aimed at developing society's robustness and capability to manage two situations: peacetime emergencies and wartime crises.

The focus is on peacetime emergency management, with the aim being to reduce the risks associated with, and the consequences of, major emergencies due to acts of either nature or man. At *Level 1* attention is focused principally on protection and preparedness against major emergencies, with *Level 2* and *Level 3* organisations delegated to deal with smaller, 'everyday' emergencies. In the event of a major peacetime emergency the focus is on the safeguarding of personal life, health and security, and the prevention or minimising of damage to property and the environment.

The emphasis is on ensuring that risks are managed on the basis of available resources, according to the principle of subsidiarity.

Three different levels of government, *Level 1*, *Level 2*, and *Level 3*, share responsibility for Civil Protection. At *Level 1* is the Swedish Emergency Management Agency<sup>59</sup> (SEMA), which coordinates Civil Protection and performs the key role of activating and supporting the Civil Protection activities of other authorities and agencies, such as the Swedish Rescue Services Agency<sup>60</sup> (SRSA), the Swedish National Police Board and the Swedish National Electrical Safety Board. It is also charged with the task of assisting in improving *Level 2* and *Level 3* emergency management capacities, with the overall aim of reducing society's vulnerability and enhancing the capacity to deal with major emergencies.

SEMA co-ordinates the development of preparedness measures, although it does not have an operative role and does not take over responsibilities from other authorities. The Agency works to promote preparedness among *Level 3* authorities and their ability to communicate with the public, media and authorities in the event of a crisis.

*Level 3* and *Level 2* administrative boards receive support to develop their emergency management capacities and their roles as the bodies with overall responsibility for their areas. The support includes training and exercises, methodology for risk and vulnerability analysis and support to build networks with authorities, municipalities, companies and non-governmental organisations (NGOs).

59 On 31 December 2008 the Swedish Emergency Management Agency (SEMA) was dissolved and a new body, the Swedish Civil Contingencies Agency (MSB), was established to coordinate Civil Protection, emergency management and civil defence.

60 On 31 December 2008 the Swedish Rescue Services Agency (SRSA) was dissolved and a new body, the Swedish Civil Contingencies Agency (MSB), was established to coordinate Civil Protection, emergency management and civil defence.



SEMA strengthens the *Level 2* county administration boards by equipping special premises for emergency management purposes and improving the security of telecommunications. It also supports the municipalities (*Level 3*) in their work to improve management in crises by, for example, providing economic support for certain investments in technology.

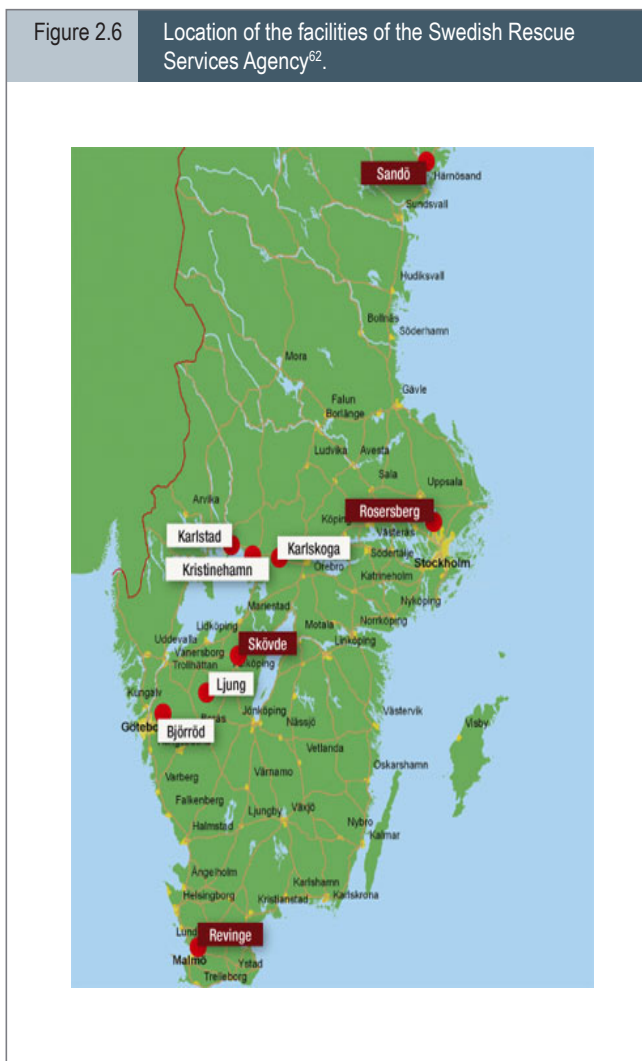
It should be noted that SEMA will be merged with the SRSA in the near future to become a unique organisation, although the exact structure and mandate of this new agency is not yet known<sup>61</sup>.

At present, the SRSA, as *Level 1* authority, targets the prevention of accidents and emergencies, and the mitigation of the injuries and damage they cause, through the running of training courses and exercises, monitoring, supervision and the provision of information.

The rescue agency is the central supervisory authority for *Level 3* rescue services. Its tasks include the supervision of co-ordination between the various *Level 1* rescue services, as well as the supervision of the planning of rescue services by *Level 2* administrative boards in the event of an emission of radioactive substances. The rescue agency also conducts post-event reviews of major emergencies that have occurred in Sweden and overseas. It also develops methods and equipment for use by the rescue services, and is responsible for the training of all personnel in *Level 3* rescue services.

The SRSA also implements safety regulations in relation to the transport of dangerous goods by road and rail, and co-ordinates the work of the supervisory authorities in this field. It employs approximately 850 people, with a head office in Karlstad. Of the four colleges associated with the SRSA, situated in Sandö, Rosersberg, Skövde, and Revinge, only two will be maintained following the restructuring and merger of the two agencies. The International Department is situated in Kristinehamn, the Swedish Centre for Lessons Learned from Incidents and Accidents is in Karlskoga, and the materiel depot is in Björnröd (see Figure 2.6).

The Swedish Rescue Services Agency has the following departments:



- The Safety & Risk Management Training Department, to which the four training colleges are associated.
- The Emergency Prevention Department.
- The Emergency Response Support Department.
- The International Department.
- The Supervision Department.
- The Legal Department.
- The Information Department.
- The Research & Analysis Department.
- The EU & International Affairs Department.

Crisis logistics and reinforcement are managed by the Emergency Response Support Department. It is interesting to note that Sweden has decided to expand its resource network to facilitate the effective management of large

61 The new agency is the Swedish Civil Contingencies Agency (MSB) and was formed following the dissolution of the Swedish Rescue Services Agency (SRSA), the Swedish Emergency Management Agency (SEMA) and the Swedish National Board of Psychological Defence, on 31 December 2008.

62 Courtesy of the Swedish Rescue Service Agency.

incidents by outsourcing. Its network now includes both national and international incident-specific resources, which may be sourced either domestically or from the EU, from public or private sources. This was an attempt at maximising effectiveness by using potentially state-of-the-art resources from other entities while simultaneously minimising costs. Furthermore, by using civilian warehouses and terminals Sweden is able to ensure that the correct materials reach the affected area in a timely manner, regardless of geographic location.

Despite the impending merger between SEMA and SRSA, the latter recently modified its structure and introduced a new service, called SRSA 24/7, which is responsible for its round-the-clock activities.

The duty officer of SRSA 24/7 acts as Sweden's point of contact for both international and national matters, and deals with urgent inquiries from collaborative authorities and organisations both domestically and overseas. The service provides access to the Agency's resources and deals with matters of urgency for personnel involved in international operations.

The SRSA is one of several agencies dealing with the prevention of disasters caused by natural hazards<sup>63</sup>. Through the Emergency Prevention Department it mainly supports rescue services and municipalities with knowledge and subsidises preventive measures in built-up environments that may be at risk of floods or landslides. The Agency has the responsibility for providing *Level 3* and *Level 2* administrative boards with general planning information, such as general stability maps and general flood-risk maps. These issues, along with the tools and procedures available in connection with the main types of risk in Sweden, are reviewed below. The overall considerations are summarized in Table 2.7.

Risk and vulnerability mapping is one of duties of the SRSA. Each competent authority, from governmental agencies at *Level 1*, to county boards at *Level 2* and municipalities at *Level 3*, is committed to performing

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63 Other institutions involved in the prevention of disasters at Level 1 are the Swedish Meteorological and Hydrological Institute; the Svenska Kraftnät (which administers Sweden's electricity network); the National Board of Housing, Planning and Building; the Swedish Environmental Protection Agency; the National Food Administration; the Swedish Geotechnical Institute; and the Swedish Geological Survey. At Level 2, the County Administrative Boards and the Water Authorities play an important role in disaster prevention. Finally, at Level 3, the municipalities have the main responsibility concerning both preventative planning, including land-use planning and other preventative measures, and for emergency activities.

an annual risk and vulnerability assessment for its area or activities<sup>64</sup>. Assessments are compiled by SEMA into an annual evaluation of risks and vulnerabilities.

The SRSA also coordinates preparedness, in collaboration with other institutions<sup>65</sup>. For several different types of risk, dynamic hazard maps are prepared, put on the web, and made available to *Level 2* and *Level 3* authorities. The latter institutions are responsible for the physical issuing of alerts and warnings, although they seldom have the capacities necessary to autonomously determine the scale of risk, and the decisions over whether to issue alerts are made at *Level 1*.

The Civil Protection Act differentiates between *Level 1* and *Level 3* rescue services. There are four *Level 1* rescue services: Mountain Rescue and General Missing Persons Search, both the responsibility of the police; Air-Sea Search and Rescue, the responsibility of the Swedish Civil Aviation Administration; and Maritime Search and Rescue, the responsibility of the Swedish Maritime Administration.

The Emergency Service for Emissions of Radioactive Substances from Nuclear Plants is the responsibility of the relevant county (*Level 2*).

All other rescue services are coordinated at *Level 3*, with each municipality being responsible for emergencies within its own borders. In the event of an emergency exceeding the management capacities of an individual *Level 3* authority, each *Level 2* administrative board has the power to assume responsibility for the rescue services in the municipalities affected.

All emergency operations must be led by an incident commander with the requisite level of competence<sup>66</sup>. If the incident commander so demands, *Level 1* and *Level 3* authorities are obliged to provide personnel, materiel and property on the condition that the authority has access

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64 The Swedish Emergency Management Agency published, in 2008, a guide for the risk and vulnerability assessment of governmental agencies: Risk and vulnerability analyses – Guide for governmental agencies; SEMA recommends 2008:3, ISBN: 978-91-85797-16-5.

65 For instance, the Swedish Meteorological and Hydrological Institute plays a fundamental role in determining the hydrological risk, whereas the Swedish Geotechnical Institute is involved in geo-technical issues.

66 According to chapter 3, section 16, of the Civil Protection Act, the chief fire officer is the incident commander, but may appoint someone else who satisfies the qualification requirements that are prescribed by the Government or the authority that the Government specifies as the incident commander.

to the resources required and that their use does not seriously obstruct the normal working of the authority. In addition, the incident commander can requisition private property and order all citizens between the ages of 18 and 65 to assist in the emergency work, to the extent that their skills, health and physical strength permit.

With regard to natural hazards, the SRSA primarily intervenes in the event of floods, landslides, forest fires and storms. Moreover, it is the competent authority in Sweden, and thereby performs the corresponding prevention activities, for the Seveso Act (industrial accidents), the Transport of Dangerous Goods Act, and the Explosive Goods Act.

Almost every year Sweden is affected by damaging floods. Since 1998, the SRSA has been creating flood risk maps of parts of the country's waterways, with the goal of mapping approximately 10 per cent of the entire system (see Figure 2.7). The maps are intended to facilitate overall planning of the work of the fire and rescue service, and as information for land-use planning. Two return periods are included on the maps: 100 years and 10,000 years<sup>67</sup>. The maps cover naturally-occurring flooding in both governed and ungoverned waterways, but do not cover floods that occur, for example, as a result of the breaching of an ice dam.

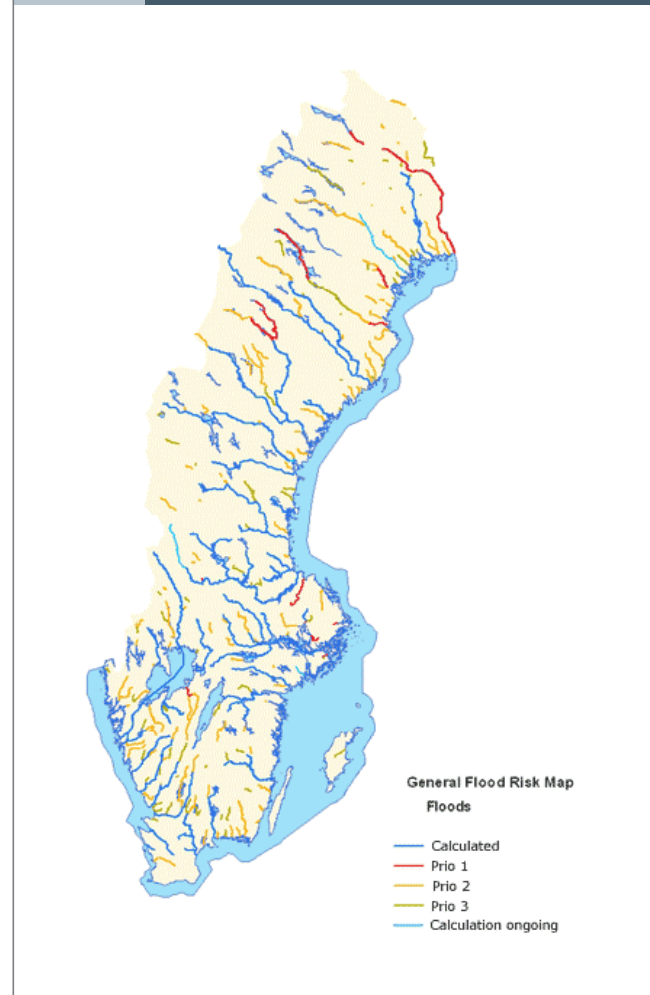
These maps are created as basic data for prevention work with the help of a watercourse model for those areas close to watercourses that are at risk of flooding, and are intended for use during the planning of emergency and rescue services' work and as a foundation for land-use planning at *Level 3*. They can also be used as basic data for various risk and vulnerability analyses. The watercourse model can also be used during the emergency stage of a flood to calculate probable water levels and the development of water discharges during the flood.

Moreover, the agency works towards the establishment of river groups, intended for collaboration and coordination of concerned stake-holders located within the drainage basin of a river.

Furthermore, the SRSA always monitors the development of the spring flood across the country by collating details from *Level 2* administrative boards about the water discharge situation. This information is compiled

Figure 2.7

The map shows the rivers in Sweden that are mapped with the General Flood Risk Maps or are given priority for calculations<sup>68</sup>.



and submitted on a weekly basis to the Ministry of Defence. In this way early signals are received about the need for materiel and other resources in the event of high water discharges and flooding. During major floods the state can, through the agency, support *Level 3* authorities with specific extra resources<sup>69</sup>.

The Swedish Meteorological and Hydrological Institute is the authority responsible for provision of comprehensive information on meteorology, hydrology and oceanography. The Institute plays an important role in predicting floods as it surveys the situation in watercourses and issues warnings for high water discharges, based on weather forecasts and hydrologic modelling.

67 Calculated in accordance with the Swedish Flood Committee's guidelines for the dimensioning of dams in risk class I.

68 Courtesy of the Swedish Rescue Service Agency.

69 The extra resources consist of such items as sandbags, temporary flood barriers and water pumps.

Table 2.7: Risk exposure and organisation in Sweden.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	storms
level dealing with impact	Level 1	Level 3	Level 2	Level 2
degree of impact	high	medium	medium	high
<b>preparedness</b>				
prediction system	working at Level 1	not applicable	working at Level 1	working at Level 1
vulnerability maps	existing	existing	existing	no
<b>alerts and warnings</b>				
procedures	working from Level 1 to Level 3	not applicable	working from Level 1 to Level 3	no available information
efficiency	high	not applicable	high	not applicable
public perception	upper-medium	not applicable	upper-medium	not applicable
<b>Response and search and rescue</b>				
procedures	working from Level 1 to Level 3	working from Level 1 to Level 3	working from Level 1 to Level 3	working from Level 1 to Level 3
efficiency	high	high	high	high
public perception	upper-medium	upper-medium	upper-medium	upper-medium

With regard to vulnerability to landslides, the SRSA is responsible for conducting general stability surveys and mapping of built-up areas. The general stability mapping covers the whole country and is carried out at *Level 3*, although only in settled areas. The survey began in 1978 in the most vulnerable municipalities. By studying soil types and topographical conditions, conducting new geotechnical surveys and compiling old surveys assessments can be made regarding ground stability.

The maps produced display different zones, which indicate areas that are susceptible to landslides. The maps also show which areas require further study. The results of the survey are then submitted to the *Level 3* authorities concerned and will be used as a guide to locate areas that might be vulnerable to landslides.

The Swedish Geotechnical Institute, which is a central authority responsible for geotechnical issues, has no direct responsibility to provide decision-support to *Level 3* or *Level 2* administrative boards, but it does have an advisory role. In emergency situations the Institute can advise the *Level 3* fire and rescue service on landslide issues.

Sweden has summers with occasional instances of major forest fires, which can result in economic as well as aesthetic damage to woodland and in certain cases also to parts of the infrastructure and to buildings. To enhance preparedness the SRSA has developed a national information system called Fire-risk - Forest and Land, for *Level 3* fire and rescue services and *Level 2* administrative boards. This is used to assess the risk of vegetation fires. A singular feature of the system, and one which is seldom found in other countries, is that the output is available on the web<sup>70</sup>. The system provides basic data for prevention work and can also assist in decision-making during emergency response operations.

During major forest fires the State can, through the Agency, support *Level 3* organisations with specific extra resources. The SRSA has set up regional resource depots for forest fires, primarily to provide support for the *Level 3* fire and rescue services. The incident commander can requisition materiel via the Agency's duty officer. Materiel resources are spread around the country, contained in 24 modules which can be easily relocated in the event of a major incident. Equipment, for the most part, consists of motor pumps, hoses, monitors, nozzles and branch pipes of varying sizes.

70 Among others, the system provides information on how the weather can influence the risk of vegetation fires.

Storms are one of the natural hazards to which Sweden is subject to. The powerful Gudrun storm in January 2005, for instance, left seven victims and caused widespread damage to the forestry sector<sup>71</sup>.

During storms resulting in serious damage the State can, through the SRSA, support municipalities with specific extra resources. The depots of the Agency contain, for example, generators that can be lent out to storm-hit areas that have lost electric power. The incident commander can requisition materiel via the Agency duty officer.

In terms of technological hazards, Sweden in 1974 acceded to the ADR<sup>72</sup> agreement drawn up through the United Nations Economic Commission for Europe. The SRSA is the competent authority for land transport (road and rail) of dangerous goods and is responsible for coordinating the regulations for sea, air and land transport in Sweden. All types of dangerous goods transport must follow the requisite regulations. Transport of dangerous goods regulations also usually apply to temporary storage in warehouses, at terminals or similar.

Furthermore, the Agency is also the national authority for issues concerning flammables and explosives, with the overall objective of obtaining incident-free handling of both.

Industrial risk is covered by the Seveso Act, based on the EU directive addressing the industrial sites where there is a risk of major accidents. There is a risk associated with the country's 10 nuclear reactors, which produce 50 per cent of Sweden's electricity. Public perception of this risk was recently highlighted following a foiled (potential) terrorist attack<sup>73</sup>.

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71 The Gudrun storm is known also as 'Erwin storm', and was a powerful storm which hit Denmark and Sweden on in January 2005. Sustained wind speeds of 126 km/h with wind gusts of 165 km/h were measured in Hanstholm, Denmark. The storm caused significant financial damage in Sweden, where the forest industry suffered greatly from damaged trees, as more than 75,000,000 cubic metres of trees were blown down in southern Sweden. About 341,000 homes lost power in Sweden and several thousand of these were without power for many days and, in some cases, even weeks. About 10,000 homes were still without power after three weeks.

72 The European Agreement concerning the International Carriage of Dangerous Goods by Road, ratified in Geneva on 30 September 1957 under the auspices of the United Nations Economic Commission for Europe, entered into force on 29 January 1968. The Agreement itself was amended by the Protocol amending article 14 (3) in New York on 21 August 1975, which entered into force on 19 April 1985.

73 At the end of May 2008 the Oskarshamn nuclear plant, in southern Sweden, was cordoned off following the discovery of explosive materials. A welder was caught with the highly explosive substance Triacetone Triperoxide on his way to the plant. An area with a circumference of 300 meters around the explosive substance was cordoned off.

## 2.4.3 Human resources and costs

Table 2.8 and Table 2.9 report the resources (in terms of available human resources and of costs, respectively) assigned to the Civil Protection structure at different levels. Please note that the eventual involvement of private contractors is not taken into account, even if in Sweden several activities (mainly in emergency periods) are outsourced, and thus a larger number of people could be involved at different levels.

In terms of human resources, the Civil Protection structure at *Level 1* and *Level 2* includes the employees of the two main agencies in charge of disaster risk reduction: the Swedish Rescue Service Agency, which employs about 850 people (about 50 per cent of whom are assigned to training colleges); and the Swedish Emergency Management Agency, which employs around 190 people. When the merging of the two agencies is completed, the new agency will also include personnel from a third agency (currently managing activities linked to the cold war). Once the merger is complete, the total number of people involved in Civil Protection during periods of peace and emergencies at *Level 1* and *Level 2* is expected to be around 0.017 per cent of the active population.

At *Level 2* and *Level 3* about 16,000 fire-fighters are involved in Civil Protection activities<sup>74</sup>, constituting about 0.3 per cent of the active population.

Table 2.9, which itemises Swedish Civil Protection costs, is organised differently from those of the previous two case studies because it is more opportune here to merge the costs at *Level 1* and *Level 2*, and itemise the costs associated with *Level 3* separately.

The overall cost of Civil Protection at *Level 1* and *Level 2* is about €193 million per year, the bulk of which is contributed by funds managed by SEMA, with the remainder contributed by several governmental organisations and agencies for various activities. The SEMA contribution is for cross-sector activities and long-term planning for *Level 1* authorities and *Level 2* administrative boards and represents about €180 million per year, with a further approximately €9 million contributed by the SRSA and the remaining €4 million per year the average for emergency preparedness and

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74 In actual fact, fire-fighters also manage several activities and interventions linked to 'everyday' accidents.

Table 2.8: Human resources involved in Civil Protection in Sweden.

HUMAN RESOURCES				
Level 1 and Level 2				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	850 <sup>(A)</sup> + 190 <sup>(B)</sup>	850 + 190	no information available	850 + 190
% of the national active population <sup>(C)</sup>	~0.017	~0.017	-	~0.017
Level 3				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	~16,000 <sup>(D)</sup>	no information available	no information available	~16,000
% of the national active population <sup>(C)</sup>	~0.27	-	-	~0.27

Notes to Table 2.8:

(A) Employees of the Swedish Rescue Service Agency.

(B) Employees of the Swedish Emergency Management Agency.

(C) The active population of Sweden, namely people from 14 to 64 years old, has been estimated at about 6 million.

(D) The total number of fire-fighters in Sweden, according to Dr. Stefan Svensson PhD, Swedish fire-fighter and research and development engineer, available online at [http://cms.firehouse.com/web/online/News/From-Sweden--a-Critical-View-of-US-Firefighters/46\\$56147](http://cms.firehouse.com/web/online/News/From-Sweden--a-Critical-View-of-US-Firefighters/46$56147)

management of military forces. The total cost of Civil Protection at *Level 3* is represented by the cost of rescue services, which stands at €640 million per year.

## 2.4.4 Civil Protection and society

The SRSA considers of great importance the spread of knowledge and risk awareness in society. This is done through various channels, including disseminating information to the public, education in schools and by training *Level 3* rescue operation personnel. The comprehensive programme of training courses meets the conditions contained in the Civil Protection Act. Training is mainly performed in the four colleges of the Agency in Revinge, Rosersberg, Sandö and Skövde.

The school education programme, which has been recently revised, covers children aged from 3 to 16.

Personnel of the *Level 3* fire and rescue services receive their training at one of the Agency colleges. They provide a range of courses from basic trade, to further

and in-service training. A new two-year Civil Protection training course was introduced in 2003 designed to provide students with the competencies required to work in a *Level 3* fire and rescue service, including accident prevention, damage and injury limitation, and conducting and following up emergency operations.

The SRSA is very active in research and cooperates with several entities, both domestic and international, which conduct or support research of interest to it. The Agency is committed to contributing to the establishment of competent research environments and is working towards the initiation of broad-based, long-term framework projects that fit into an interdisciplinary context.

The Agency has a formal decision process for the funding of research projects, which makes it possible for individual researchers, universities and research institutes to apply for research grants. Prior to the annual notification of research funding the Agency can decide to concentrate on a specific theme or themes within which one or more research environments can take on a larger umbrella project made up of several parts.

Table 2.9: Average annual costs of the Civil Protection system in Sweden.

ANNUAL COSTS						
Level 1 and Level 2						
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'emergency periods'	cost of professional fire-fighters at Level 1 and Level 2	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	6 <sup>(A)</sup>	no available information <sup>(B)</sup>	no available information	no available information	no available information	193 <sup>(C)</sup>
% of the national GDP	-					-0.076
Level 3						
	public servants involved in CP in 'peace periods'	cost of professional fire-fighters at Level 3	operational cost of equipment, technologies and emergency assets	average annual cost for post-emergency recovery	total funding for Civil Protection	
euros (millions)	no available information <sup>(D)</sup>	no available information <sup>(D)</sup>	no available information	no available information	640 <sup>(E)</sup>	
% of the national GDP	-				-0.25	
research and development						
	Investment in universities, research agencies and/or organisations working for Civil Protection (network of competence centres)	maintenance for universities, research agencies and/or organisations working for Civil Protection (network of competence centres)	public or private companies supplying hardware and software			
euros (millions)	no available information <sup>(F)</sup>	no available information <sup>(F)</sup>	no available information <sup>(F)</sup>			

Notes to table 2.9:

- (A) This amount includes only the cost relevant to the Swedish Rescue Service Agency in the years in which no relevant disaster has to be faced.
- (B) In the years in which a relevant disaster has to be faced, the Swedish Rescue Service Agency spends on average a further €3 million, but actually this amount covers the cost of private contractors involved in Civil Protection and the rental of necessary resources.
- (C) The amount is composed of the contribution of several governmental agencies and organisations: the funds managed by the Swedish Emergency Management Agency for cross-sector activities and long-term planning for Level 1 authorities and Level 2 administrative boards (about €180 million per year), the costs of the Swedish Rescue Service Agency both in peace and emergency periods (about €9 million per year), and the average cost of military forces for emergency preparedness/management (about €4 million per year).
- (D) The overall cost for personnel at Level 3 in peace and emergency periods is about €255 million.
- (E) Expenditure for rescue services at Level 3 in 2006; the main items of this amount are contributions/transfer payments – €260 million – and personnel costs – €255 million.
- (F) The funds for research in the area of disaster risk reduction are taken into account in the overall budget of the Swedish Rescue Service Agency and of the Swedish Emergency Management Agency.

The research programme for the period 2007–2010 refers to four different areas, namely:

- General safety issues – addressing safety cultures, organisational learning, communication of risk, risk perception and risk evaluation.
- Prevention of emergencies and their consequences – the aim of this field of research is, among other activities, that of developing new knowledge that can contribute to preventing emergencies and their consequences for people, property and

the environment; this area is meant to explore emergency cause correlation, means of control and cost effectiveness.

- Injury damage limitation work – this programme area aims to develop new knowledge about how to improve societal capacities for limiting emergencies and their consequences; this goal can be pursued by examining the results of emergency response operations, by developing response capacities, by designing response systems, or by optimising response preparedness.

- International work – this programme area refers to research as support for international humanitarian operations for disaster management from various perspectives, and aims to increase knowledge about emergency humanitarian operations, as well as recovery, prevention, preparatory and capacity-building operations.

It is expected that research results be communicated in different ways, as an ongoing process during the lifetime of a project, and then via the obligatory research report and articles in scientific journals, at seminars, and during other activities for various end-user groups, and to the colleges of the SRSA. The responsibility for informing about and implementing results is shared between the researcher and the body financing the research.

SEMA also provides funding to other entities, both individuals and institutions at national or international level. The Agency coordinates research and development in the emergency management area. Moreover, it analyses societal security, partly on the basis of annual risk and vulnerability analyses provided to it by each governmental agency. The results of this work are presented annually through threat and risk reports.

The Swedish Meteorological and Hydrological Institute and the Swedish Geotechnical Institute are among the *Level 1* institutions involved in research on disaster risk reduction issues. The former is involved in research into future climate scenarios for Europe, with early results indicating that the risks from flooding, heavy rainfall, heavy snowfall and storms can be expected to increase. The Swedish Geotechnical Institute is responsible for the development of geotechnics and focuses on research into geotechnical issues and information dissemination.

In terms of cross-border activities, Sweden has been active in the West Balkans area from the early stages of the DPPI, at first as a donor and then latterly as a supplier of expert support on a range of activities.

Bilateral and trilateral agreements have been signed between Sweden (more precisely, by the SRSA) and some of the countries of South Eastern Europe. A trilateral agreement was signed with Slovenia and Albania, and important cooperation activities in connection to training are performed with Slovenia<sup>75</sup>.

The Agency is very eager to pursue international cooperation and UNISDR is viewed as an important coordinator in this matter. Sweden supports the strengthening of national platforms in each country and their coordination by UNISDR.

## **2.4.5 Areas of excellence in the Swedish Civil Protection system**

A number of points of excellence emerge from this brief review of the organisation of Civil Protection in Sweden:

- Capacity sharing: Sweden's early involvement in the West Balkans through the DPPI has brought about tangible benefits which have been applauded region-wide. Its cooperation with Slovenia to develop training centres and courses on Civil Protection, for instance, have been useful to enhance capacity in the region.
- Comprehensive database: Sweden's willingness to share capabilities in disaster risk reduction is also clear in connection with this second area of excellence. The database contains detailed information about accidents, emergencies and disasters and includes comprehensive post-event analyses. The picture that emerges is a detailed review of hazard risk in Sweden. Evaluations are currently under way to examine the potential of using the database as a model for analogous initiatives in other EU countries. The European Commission Joint Research Centre has already demonstrated its willingness to cooperate in this project.
- Preparedness: Preparatory steps are being taken ahead of the expected increase in extreme weather events. The Swedish Commission on Climate and Vulnerability was appointed by the Swedish Government in June 2005 to assess the impact of global climate change on Swedish society<sup>76</sup>, based on the hypothesis that, by the end of this century, Sweden would become appreciably warmer and wetter. Among the several considerations introduced into the report the issues relevant to natural hazards like floods, landslides and storms were considered as important aspects to be investigated. The report stated that the risk of floods, landslides and erosion in many areas was increasing to such an extent that stronger initiatives

<sup>75</sup> For instance, the Civil Protection training centre in Slovenia was designed with the help of Swedish expertise.

<sup>76</sup> Ministry of the Environment - The Commission on Climate and Vulnerability, Sweden facing climate change – threats and opportunities, Stockholm 2007.



were justified. This led, among other considerations, to the proposal of obliging *Level 3* municipalities to take account of the risk of floods and landslides in physical planning. Moreover, the necessity of preparing an expanded database and developing warning systems to reduce vulnerability was stressed.

- Flexibility: These considerations, together with the change in public perception of Civil Protection, demonstrate that the overall system is forward-

looking and capable of adapting to the new threats linked to natural and technological hazards. The restyling of the agencies involved in Civil Protection, and the recent introduction of a technical and political group assisting the Prime Minister in disaster risk reduction issues, are signals of how the Swedish system is adapting to new necessities and threats, following the path of other countries in which Civil Protection roles and responsibilities are defined with more precision.



# 3

**South Eastern Europe  
country reports**

## 3.1 Albania

### *Public perception of Civil Protection*

The rapid transition to a new period of dynamic development has proven challenging for the government structures of Albania, which have had to deal with a number of substantial issues, including high unemployment and a dilapidated physical infrastructure<sup>77</sup>. Although the macro-economic indicators have grown significantly, Albania remains one of the poorest countries in Europe, with a dramatic shortage of technological capacity and inadequate energy and transportation infrastructure. The organisation of Civil Protection reflects the general situation of the country and, although the population demonstrates fair interest in participating in the initiatives carried out by local civil emergency agencies, the majority of people are not yet familiar with the overall structure of the Civil Protection sector<sup>78</sup>.

### *Demography and administration*

Albania has a population of approximately 3.6 million people (2007), giving it an order of magnitude of *Level 1* according to the classification adopted in this review<sup>79</sup>. The largely rural population is spread over an area of around 30,000 km<sup>2</sup>. However, as a consequence of the dramatic social and economic changes experienced over the last 15 years, there is an increasing flow of people to urban centres. Such is the rate of migration from rural areas that urban sprawl now represents a major problem for Civil Protection, since the suburbs are often located in high-risk areas which can be vulnerable to natural hazards or industrial accidents.

Albania is subdivided into 12 counties (Qarks), each with an order of magnitude of *Level 2*. The counties are under the administration of prefects, who can assume responsibility for managing responses to civil emergencies at county level.

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77 The CIA factbook, Albania, <https://www.cia.gov/library/publications/the-world-factbook/geos/al.html>

78 UNDP, Albanian Red Cross Association, Local Vulnerability and Capacity Assessment in Albania, 2004.

79 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

Counties are composed of 36 districts (*Level 2* and *Level 3*), which are in turn subdivided into 309 communes and 65 municipalities. Sub-prefects are coordinated by prefects and can assume responsibility for managing municipal fire brigades and first-response teams in cases of emergency.

### 3.1.1 Legislation

The legislation covering disaster management in Albania reflects the fast-moving processes which are transforming the centralized structures of the sector into an essentially decentralized scheme based on a network of local decision-centres. To appreciate the dynamic behind these processes of change it is useful to examine briefly the recent historical context.

The Civil Defence Service, under the Ministry of Interior, was established in 1964 and evolved into a system of six sub-services (Air Alert, Sheltering, Evacuation, Anti-Chemical Protection, Planning and Controlling of Bomb-Shelter Constructing Works, and Fire-Fighting) and four different operational forces (Nuclear Bacteriological Chemical Protection Teams, Rescue Teams – in different enterprises and plants – Fire-Fighting Stations, and Armed Forces). Although the original tasks of the Civil Defence Service were essentially the protection of civilians during invasions or wars, its remit also included the organisation of first-response operations following disasters caused by natural hazards or industrial incidents.

In more recent times, following the long period of government under Mr. Enver Hoxha, the Republic of Albania has experienced new and complex scenarios related to the country's internal situation as well as the whole political modifications of the Balkan region.

In 2001 the international crisis in the Serbian Province of Kosovo produced large numbers of refugees hosted within the borders of Albania. The Civil Defence Service was faced with new and significant problems which highlighted its actual capacity to manage a crisis situation, and eventually demonstrated the need to adopt a new comprehensive legislation on Civil Protection.

In response to the new challenges the institutional role of the Civil Defence Service was twice changed, firstly by moving it from the Ministry of Defence to the Ministry of Local Autonomies and subsequently, in 2005, to the Ministry of Interior.

In the meantime a new integrated Law on Civil Emergencies<sup>80</sup> was adopted by the Albanian Parliament establishing the legal basis of Albanian civil emergency services, established through a network of central and local non-military structures<sup>81</sup>.

Law 8756, in March 2001, was the first move towards the establishment of a more modern Civil Protection system faced with new and more complex challenges and operational requirements. The law encompasses the planning, prevention and preparedness system and defines first coordination among the different actors in civil emergency response operations. The law considers both disasters caused by the impact of natural hazards, including earthquakes, floods, landslides, avalanches, strong winds, forest fires and epidemics, and disasters due to human causes, including transportation accidents, urban fires, explosions, dam collapses, NBC releases, riots and war.

The Government is officially recognised as the first actor in civil emergencies. Its stated duties are to prevent, mitigate and restore any damage suffered by the population, animals, properties, cultural heritage and environment.

According to Article 5 of Law 8756, the Council of Ministers has the overall responsibility for civil emergency planning and response, while an Inter-Ministerial Committee (IMC) coordinated by the Prime Minister has to be established by the Council of Ministers in case of countrywide emergency situations. The IMC gathers all the ministries involved within civil emergency operations under a unique coordination structure, aiming to speed up decision-making, especially in cases of international requests for intervention through international agencies.

The Ministry of Interior has overall responsibility for managing Civil Protection (Art. 8). Law 8756 introduced a technical directorate, namely the Department for

Civil Emergency, Planning and Response (*Sherbimi i Emergjencave Civile*), part of the Ministry of Interior, which is responsible for the implementation and the adoption of the law at local level.

The Technical Consultative Commission of Experts, part of the directorate, advises on technical aspects of Civil Protection. The Department for Civil Emergency Planning and Response can channel investment from public institutions into research in disaster prediction and prevention (Art. 11).

Prefects are responsible for civil emergency management in each county (Art. 13), through Local Commissions (Art. 14) and Civil Emergency Services established in municipalities and communes (Art. 15 -17).

The adoption of Law 8756 has been followed by several decisions aimed at defining the tasks and roles of the different Civil Protection actors. Decision 644, February 2002, states that the Institute of Geosciences, and the Institute of Energy, Water and Environment of the Polytechnic University of Tirana, are the official monitoring bodies for the Department for Civil Emergency, Planning and Response. The Department can involve such institutes for studies and data in the fields of planning, mitigation, early warning, preparedness and response.

Decision 663, December 2002, defined the tasks of the Advisory Technical Commission, which was composed of permanent members, temporary members and invited members whose main goal was the preparation of the National Civil Emergency Plan.

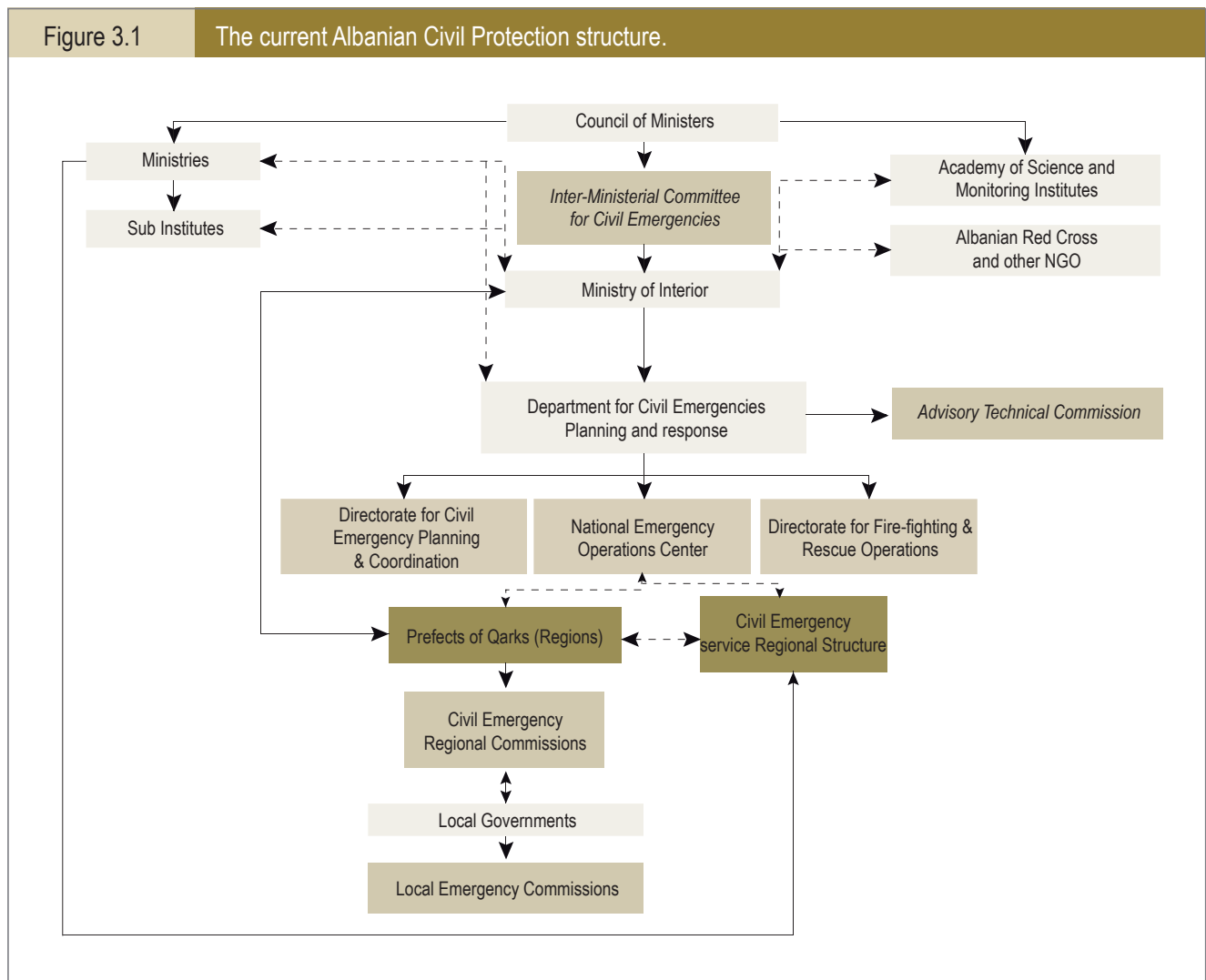
In December 2004 the Albanian Council of Ministers adopted the National Civil Emergency Plan, the development of which was supported by the United Nations Development Programme (UNDP) and the Department for International Development. The rationale of the plan was to stress the participation of civil society within the Civil Protection structures and define the strategy and the main targets of the Department for Civil Emergency, using EU good practice as a reference point and after consideration of wider regional developments in the Balkans. The plan defines the roles and duties of all relevant governmental institutions and civil organisations involved in Civil Protection for all phases of emergency management. A special emphasis is on Albania's cooperation with other countries.

The National Plan includes risk assessment studies carried out by all relevant institutions and organisations in Albania.

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80 Law 8756, 26.03.2001 'Për emergjencat civile'

81 The legislation in force is based on the following main laws: Law n. 8756, 26.3.2001, on 'Civil Emergency Services'; Decision n 663, 18.12.2002, on 'Composition, Functioning and Liabilities of the Technical Expert Advisory Commission on Civil Emergencies'; Decision n 664, 18.02.2002, on 'Criteria and Procedures of Proclamation of the Civil Emergency Situation'; Decision n. 655, 18.12.2002, on 'Establishment and Functioning of the National System Structure on Civil Emergency Planning and Response'; Decision n. 532, 1.8. 2003, 'On Liabilities and Tasks of the Civil Emergency Planning and Response Department'; Decision n. 533, 1.8. 2003, on 'Citizen Involvement in Civil Emergency Prevention and Response'.



It highlights the roles of all institutions and organisations involved in the different phases of emergency management.

Law 8756 has subsequently been modified by institutional and technical commissions, and the aim was to present to Parliament a draft of it before the end of 2008. According to the new law the structure of the Department of Civil Emergency will be based on a more functional and versatile scheme that should simplify the cumbersome command and control chain of the previous, rigid and centralised, system. An integrated system of communication and early-warning for civil emergencies will be introduced as a unified 112 Operational Centre. Moreover, the new Civil Protection structure will adopt a multi-level system, emphasizing the role of local levels, whose competencies and responsibilities will be enhanced and enlarged to include preventative activities and planning, under the responsibility of prefects.

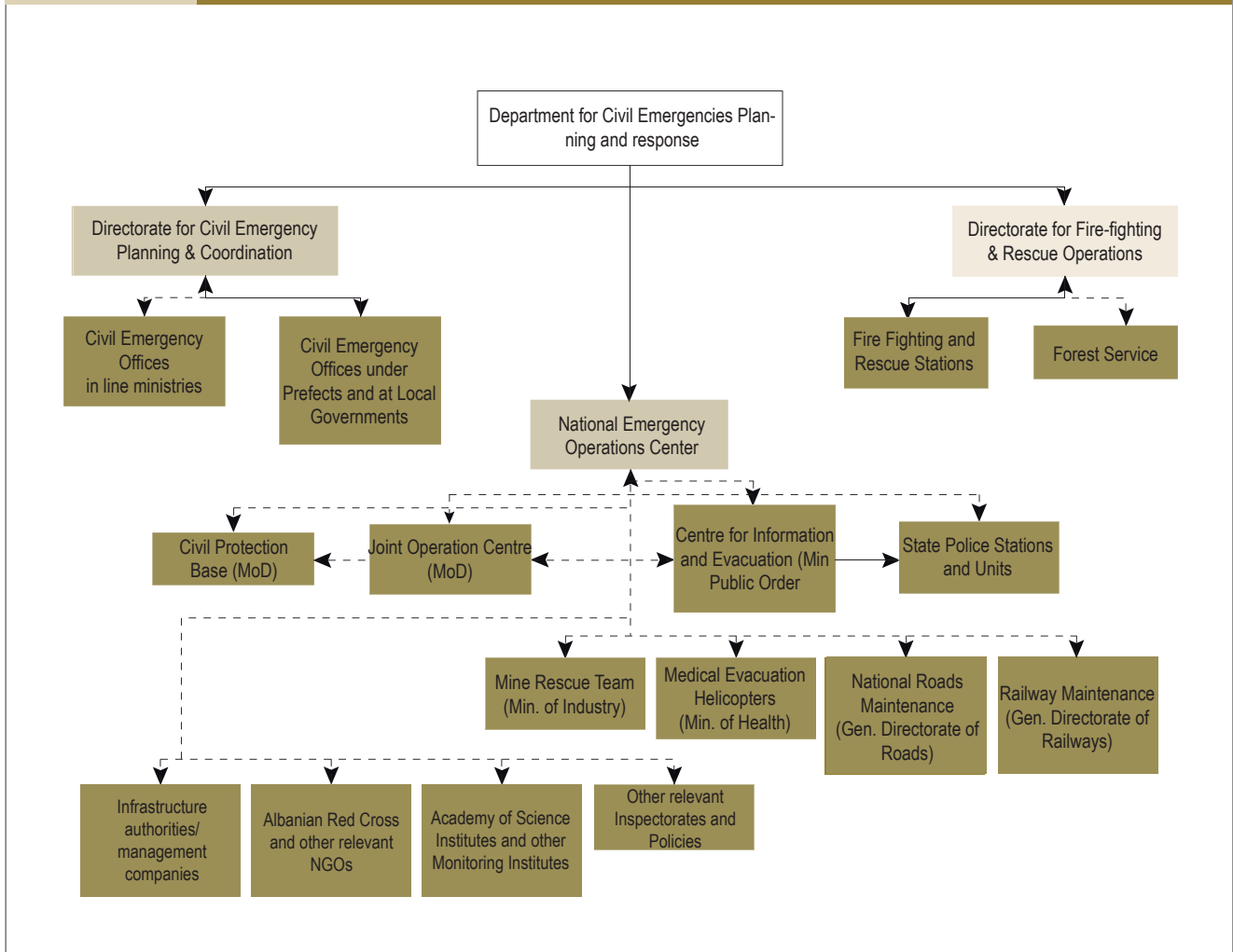
A network of five or six Regional Headquarters (*Level 2*), each having authority over a set of three or four counties, is to be established to create a system of reliable, capable and autonomous bodies able to manage and coordinate operations during ‘ordinary’ emergencies.

The Department of Civil Emergency in Tirana will provide local Civil Protection managers with standardized training courses through a National Training Centre for Civil Emergencies, while a National Inspectorate for Civil Protection will check the quality level of the local centres and will control the application of laws.

### 3.1.2 Civil Protection structure

As defined by law, the Department of Civil Emergency, Planning and Response, under the Ministry of Interior, is the national governmental structure with responsibility for implementing Civil Protection law at local level.

Figure 3.2 The structure of the Department for Civil Emergencies, Planning and Response



A general director manages the Department through three structures (see Figure 3.1):

- The Directorate for Civil Emergency Planning and Coordination.
- The National Emergency Operations Centre.
- The Directorate for Fire Fighting and Rescue (FFR) Operations.

There is a civil emergency staff of 13 at central level, including the General Director and the heads of the Directorates.

Atop these three permanent structures, but only in cases of severe emergencies that threaten national security, is the Prime Minister, who has the authority to declare a National Emergency Situation (*Level 1*). For the duration of the National Emergency Situation, usually 10 days, an Inter-Ministerial Committee for Civil Emergency

is established by key ministers (i.e., the Minister of Interior, Minister of Defence, Minister of Environment and Minister of Health). The General Director of Civil Emergency is designated as Head of the Operations (*Level 1*). Prefects represent the Department at local level and are accountable for Civil Protection in counties and districts (*Level 2* and *Level 3*). District sub-prefects are responsible for the coordination of local fire brigades, while the presidents of communes and municipalities are the main actors in cases of emergencies within their territories (*Level 3*).

Prefects and commune presidents (*Level 2* and *Level 3*) are able to convene specific periodic civil emergency commissions, usually monthly. The commissions' purpose is to check the realization of public works carried out at municipal or commune level to mitigate risks, and the reconstruction of public infrastructure damaged or destroyed following previous incidents. They do not control budgets.

Figure 3.3

Hydraulic risk in Albania: 100-year return period flood map and flood risk map<sup>82</sup>.

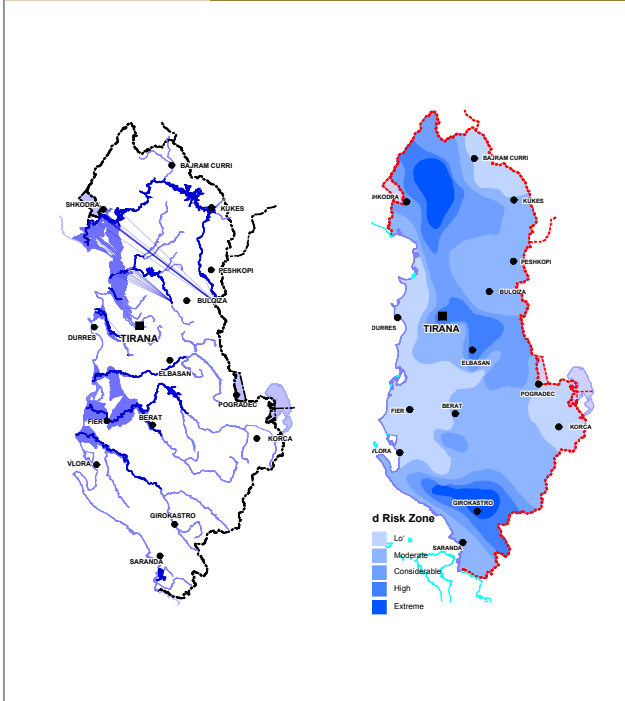
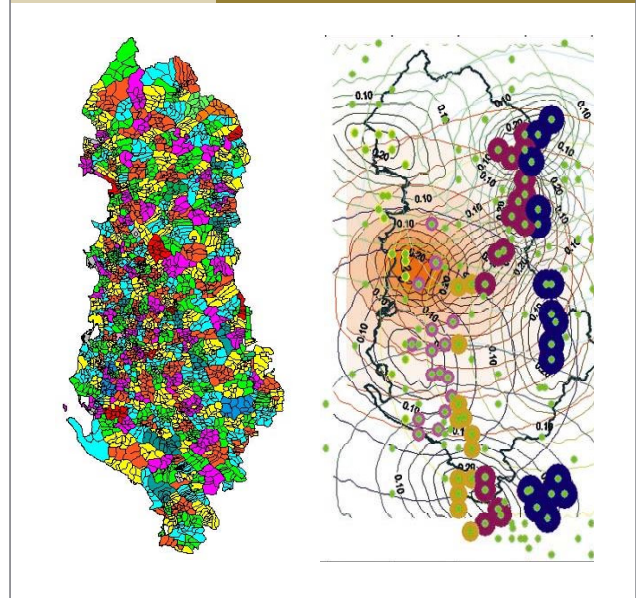


Figure 3.4

Some examples of seismic risk maps of Albania. Risk assessment map for municipalities and villages for 100-year return period and expected mortality for assigned seismic scenarios<sup>82</sup>.



The Department of Civil Emergency, Planning and Response, through its directorates and other structures (Figure 3.2), is responsible for the following major tasks:

- Inspection of preventative structural measures carried out in the territory for the mitigation of natural risk.
- Coordination of all Civil Protection activities at *Level 1* and local levels.
- Training and technical instruction of personnel within the Civil Protection structure.
- Establishing cooperation and agreements with regional and international Civil Protection agencies.
- Assessing risk, coordinating resources, sizing and dispatching first-response in case of emergencies.
- Providing the technical secretariat of the Inter-Ministerial Committee for Civil Emergencies.

The National Emergency Operations Centre (NEOC) has a wide range of responsibilities and duties during emergencies. After receiving requests for assistance from prefects it firstly coordinates with the State Police a first-response intervention in the emergency. In case of a major

event the NEOC activates the Centre for Information and Evacuation and coordinates its activities. The NEOC cooperates with the Joint Operation Centre, under the responsibility of the Ministry of Defence, for the dispatch of rescue teams from the Civil Protection Base (art. 19, law 8756/2001).

The NEOC coordinates Civil Protection activities during operations involving rescue operations in mines (Ministry of Industry), medical evacuations (Ministry of Health), 'national roads maintenance' (General Directorate of Roads) and 'railway maintenance' (General Directorate of Railways). It can coordinate and involve within the emergency phase further operational actors, both public bodies (the Albanian Red Cross and other NGOs, art. 23 Law 8756/2001) and private companies, from *Level 1* to *Level 3* (art. 25 Law 8756, March 2001).

Every morning the NEOC sends to the General Director of Civil Emergency a detailed report containing a list and description of all the emergencies that have occurred within the previous 24 hours in Albania. The same report contains

82 Courtesy of Department for Civil Emergency, Planning and Response, Tirana (Albania).

83 Courtesy of Department for Civil Emergency, Planning and Response, Tirana (Albania).



Figure 3.5

Hydrogeology risk map (stability map) of Albania, and avalanche risk map of Albania<sup>84</sup>.

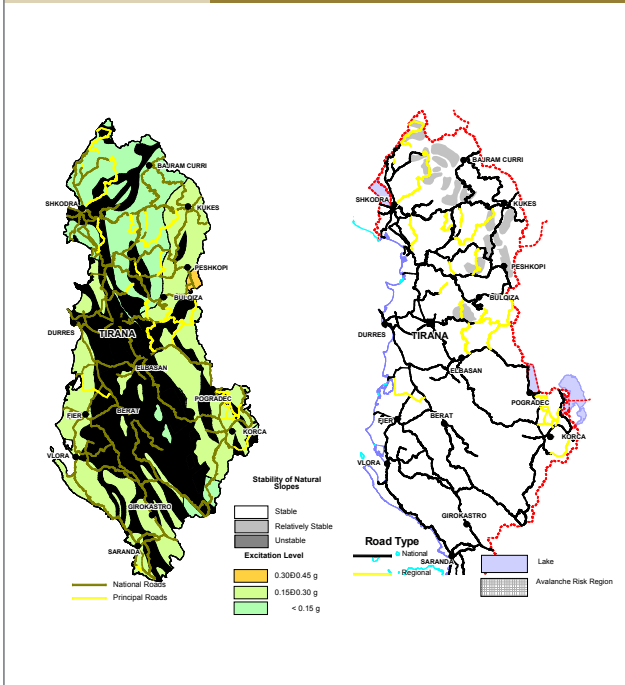
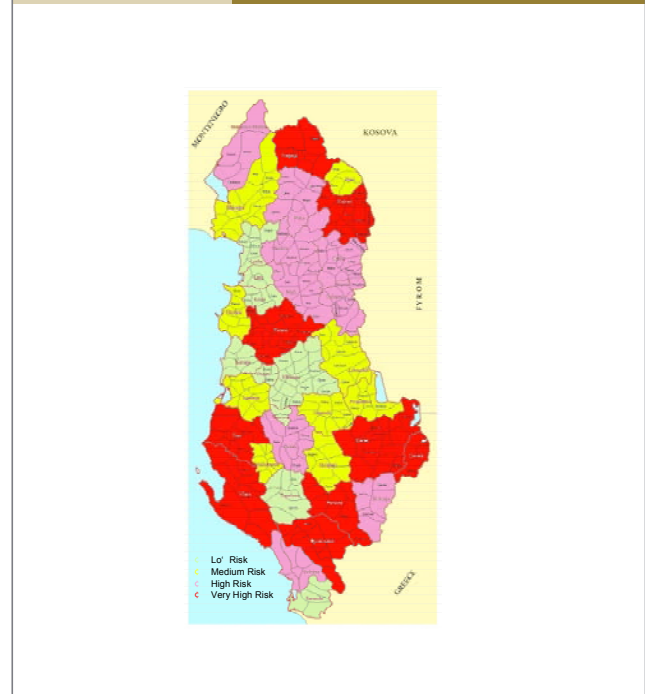


Figure 3.6

Wildfire risk assessment map for Albanian districts<sup>85</sup>.



a concise weather forecast for the day and some notes on possible critical situations.

Albania is very vulnerable to natural hazards, both geophysical and meteorological, and the level of risk is high. The risk is compounded by the complex topography of Albania (70 per cent of the territory is mountainous with a rugged coastline), and the rural nature of its settlements, with hundreds of small villages. All pose a critical problem for the country's Civil Protection services, severely limiting their emergency response capacities.

Frequent floods and landslides are responsible for most of the damage and casualties, while wildfires and adverse weather conditions, including drought and snow storms, are a threat to the biota and agriculture.

In 2003, the first official Disaster Risk Assessment in Albania was published. This study, carried out under the responsibility of the Ministry of Local Government and Decentralization (now Ministry of Interior) and the UNDP within the Disaster Management and Emergency Preparedness Project, represented the first nation-wide

assessment of the major risks faced by Albania. As part of the study, GIS-based risk-zone maps for earthquakes, floods, landslides, forest fires, snow and avalanches were prepared covering the country.

The GIS-based data was combined with other parameters, such as population density, land use and location of road networks etc., to develop specific vulnerability assessments.

Figures 3.3, 3.4, 3.5, and 3.6 show some examples of GIS mapping produced with reference to the major natural risks of Albania.

The National Civil Emergency Plan (NCEP), adopted by the Council of Ministers in December 2004, represents the reference document for coordination structures and mechanisms in Albania. The plan defines the organisation, roles and duties of all relevant governmental institutions and civil society organisations involved in Civil Protection during all phases of emergency management, establishing the responsibility for civil coordination both at national and local level.

84 Courtesy of Department for Civil Emergency, Planning and Response, Tirana (Albania).

85 Courtesy of Department for Civil Emergency, Planning and Response, Tirana (Albania).

--The plan also defines the tasks of each institution or organisation involved during the emergency phase. The order of response is:

- a. First-response, which is a task of local government. It must inform the prefecture and NEOC regarding the magnitude of the event;
- b. NEOC coordinates activities through the prefecture;
- c. In case of a major incident, the prefect of the county requests intervention at central (Department) level;
- d. The Council of Ministers may declare a national emergency situation;
- e. An Inter-Ministerial Committee is established, according to the NCEP;
- f. Resources are activated by central level;
- g. International agencies may become involved with emergency management.

The geographical position of Albania and the nature of its topography mean that it is frequently affected by intense precipitation. At least six catastrophic floods have struck Albania during the last 150 years. In 1962, 100 km<sup>2</sup> of agricultural land was submerged by floods, while more recently, in 2002, enormous damage was caused when 35 km<sup>2</sup> was inundated.

The Institute of Geosciences, the Energy, Water and Environment Institute, and the Nuclear Institute of the University Polytechnic of Tirana are the organisations that are legally responsible for the monitoring of the geophysical, meteorological and environmental variables related to natural and technological risk. The Energy Water and Environment Institute (the former Hydro-Meteorological Institute of the Academy of Sciences) is legally responsible for monitoring this structure for the Department of Civil Emergency.

The weather forecasting office of the Institute of Energy, Water and Environment receives information and data daily from 15 meteorological stations spread across Albania. However, it should be noted that the Institute has limited capacity to provide reliable and up-to-date meteorological data. There is no national remote-sensing data, such as that provided by weather radar, or the kind of on-line data from automated hydrological or meteorological stations that is needed for comprehensive emergency management and Civil Protection. At present, the only forecasting information is obtained through

meteorological models operated by the meteorological services of France and Montenegro.

Decision n. 664, February 2002, contains details of the criteria for the proclamation of a civil emergency situation and the procedures to follow. In case of flooding, the civil emergency situation can be declared when:

- The water level reaches critical points in certain control sections;
- One or more rivers have breached their banks, causing a dangerous situation;
- Reservoirs or dams are heavily damaged;
- Civilian lives or the lives of livestock have been lost or property damaged.

The criteria the Department uses for the proclamation of a civil emergency are defined according to the effects the emergency is having on the affected zone, and on the basis of the response capabilities of the local (usually *Level 2*) government units.

Under the terms of the procedures for declaring a civil emergency, the Energy, Water and Environment Institute and/or the local government authority's technical body should issue to prefects and/or the NEOC data relevant to the current event at least every four hours.

However, this is currently not feasible because the Institute does not have enough resources to guarantee a service 24/7/365. The forecasting centre is run by a very limited number of meteorologists working daily on a 7 a.m. to 8 p.m. shift. Moreover, the communication facilities are not available 24 hours per day, and real-time data from observation stations cannot be automatically collected and broadcast.

The main operational forces deployed to cope with emergencies of this magnitude are the Army, coordinated by the Ministry of Defence, the Fire Brigade (art. 22, Law 8756, March 2001), the Albanian Red Cross and private companies contracted at local or central level. The National Directorate for Fire Fighting and Rescue coordinates the fire-fighting teams through the municipal stations under the jurisdiction of district sub-prefects.

Forest fires are considered by the Department of Civil Emergency to represent an even greater threat than flooding because of their potential to destroy large

tracts of forested land. The situation is made worse by the increasing sprawl of urban areas (causing a corresponding rise in wild-land/urban interfaces), the lack of monitoring or control structures in forested areas and an increase in extreme weather events. There have been several catastrophic fires in recent summer seasons that have exceeded the management capacities of the Albanian Civil Protection sector, which lacks the assets to deal with such large events.

Fire-fighters are actively deployed by the Department to cope with wildfires. However, it is worth observing that the quantity and the quality of the engines, trucks and means allocated to local Fire Brigade headquarters are limited, restricting their effective response capabilities. Furthermore, there are no airborne fire-fighting teams in Albania and neither water-bombers nor heli-tankers are deployed by the military.

The Directorate for Fire Fighting and Rescue Operations cooperates with the National Forest Service of the Ministry of Environment. The local headquarters of the National Forest Service are dispersed throughout the country, with one in each district. When a wildfire occurs, Service personnel attend the scene but are active during the operational phase only, as observers or technical advisors. At present, the Service has no vehicles suitably equipped to cope with wildfire.

The present fire-fighting capacity of local and national forces in Albania is not sufficient to tackle large wildfires, especially in the presence of multiple simultaneous events. The only way of tackling such emergencies is to address a request for assistance to the Monitoring and Information Centre (MIC) or to the Euro-Atlantic Disaster Response Coordination Centre (EADRCC) of NATO.

Specific memorandums of understanding, signed by the Department of Civil Emergency with analogous foreign regional structures, allow the intervention of mixed international teams of fire-fighters to cope with wildfires burning in boundary regions between Albania and its neighbouring countries.

The dynamics of forest fires and flooding are driven by meteorological variables which can be forecast with the application of suitable tools. In Albania's case, the scarcity of resources and the complex operational deployment of first-response teams due to the inadequate road network, lack of fire-fighting aircraft and challenging topography

make apparent the great benefits attainable by the country's Civil Protection sector from the use of effective anticipation tools based on dynamic hazard assessment<sup>86</sup>.

Albania is positioned in an active seismic zone historically subject to catastrophic earthquakes. There is evidence of seismic events in the region dating from as early as the second and third centuries B.C., while at least 55 earthquakes with MSK 64 intensities of VIII degrees have been recorded, 36 of them in the nineteenth century alone. In recent times, the Shkodra earthquake, which struck in April 1979, had a magnitude of Ms 6.6 and left 35 dead, 382 injured and thousands homeless in Albania<sup>87</sup>.

The instrumental monitoring of seismicity started in 1968 with the opening of the first seismographic station of Tirana, which was followed in 1976 by the launch of the Albanian Seismological Network. In 1984, the SMA-1 network of 28 strong-motion instruments was installed throughout the country, although a lack of spare parts and technical assistance rapidly reduced the system's operational capabilities. The absence of strong-motion data for a seismic country is a cause of severe vulnerability for the population.

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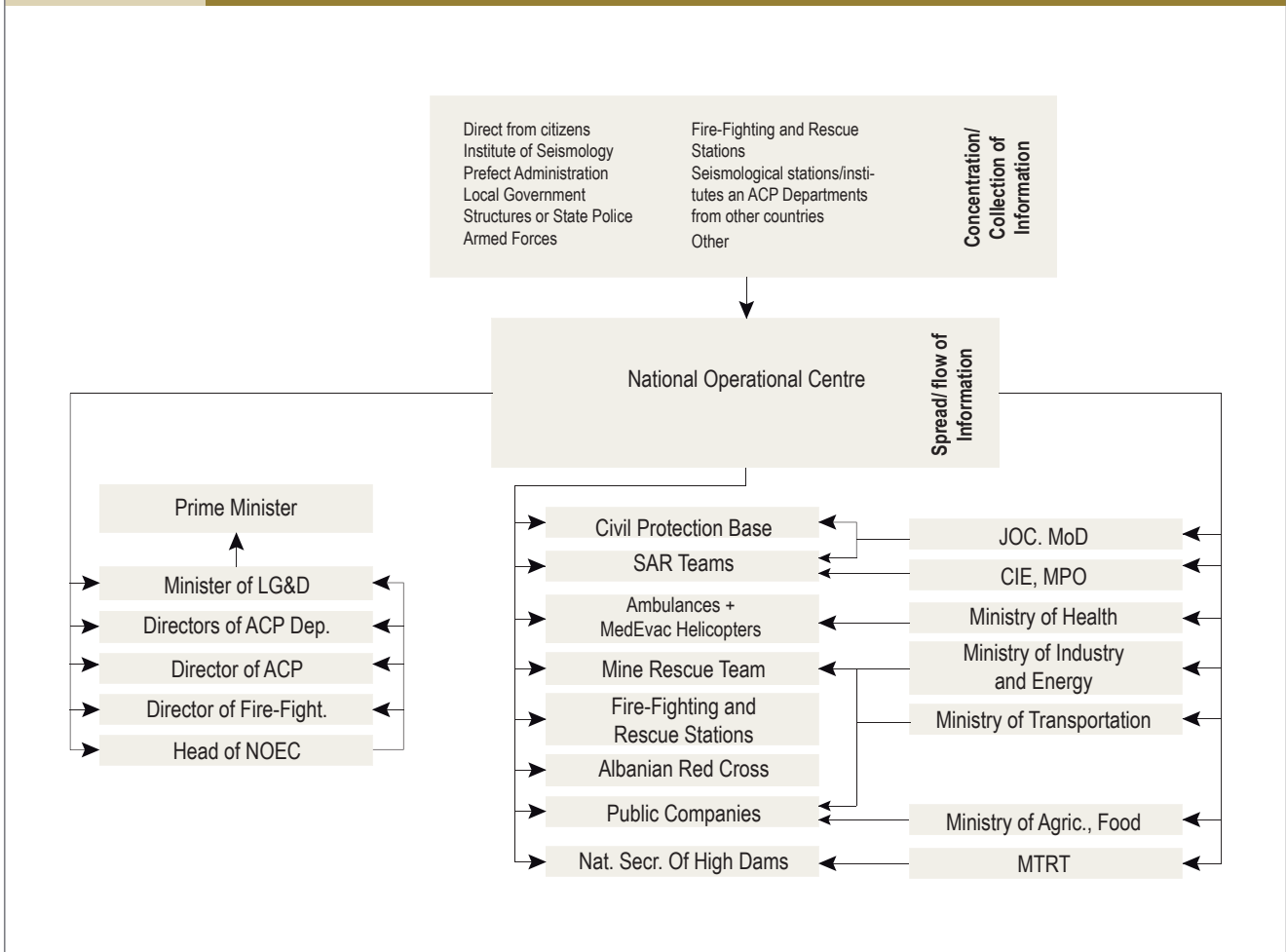
86 Generally speaking, dynamic hazard assessment requires real-time information and meteorological forecasts with reference of a certain time horizon (say 2-3 days). Along with forecast information, the real-time information used for dynamic hazard assessment may come from different sources: present weather conditions, ground-measured data relevant to hydrology or vegetation, data coming from satellite or airborne sensors.

The main advantage of a dynamic hazard assessment is that of identifying, within the considered territory, the areas affected by the highest hazard, and the time intervals within the considered time horizon in which this hazard takes place. The purpose of dynamic hazard assessment is that of getting reliable information useful to take a number and a variety of preventative (tactical) actions that can reduce, mitigate or remove the impact of expected risk scenarios over the considered territory, within the considered time horizon. Such actions may include, for instance, re-locating the available resources over the territory, recalling day-off resources to service, alerting local authorities or emergency managers, issuing prohibitions of some dangerous practices, and patrolling the areas affected by the highest hazard.

87 UNDP, disaster risk assessment in Albania – Executive summary report, 2003.

Figure 3.7

The scheme adopted by the Department of Civil Emergency, Planning and Response to cope with earthquake disasters.



Decision n. 664, February 2002, specified the procedures involved for the declaration of a state of civil emergency in cases of earthquakes.

No more than two hours after a seismic event the Seismologic Institute of the Polytechnic University of Tirana<sup>88</sup> submits to the Department of Civil Emergency, Planning and Response its preliminary readings, updating this data on a periodical basis until termination of the seismic waves. On the basis of this data, and on the preliminary assessment of anticipated damage levels produced by the Institute, commune or municipality, and county, the Department presents a report to the Minister of Interior (formerly known as the Minister of Local Government and Decentralization). The Council of Ministers decides on the proclamation of an emergency situation.

The main operational first-response force is the Fire Brigade, with the Army deploying manpower and resources (including helicopters) for subsequent emergency phases.

In terms of technological hazards, despite the fact that a large part of Albanian society remains essentially rural, with agriculture still accounting for over 50 per cent of GDP, hazards related to industrial production or other technological sources are increasing, and in some areas are perceived as critical. Industrial facilities are generally aged and especially vulnerable to the effects of adverse weather or accidents.

The recent dramatic incident at the Army's weapons depot at Gerdec (Tirana), which left more than 50 dead and 200 injured, shows the great vulnerability of a territory denoted by scarce urban planning.

88 Now known as the Geo-science Institute.

Table 3.1: Risk exposure and organisation in Albania.

NATURAL HAZARDS	Floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with event	Level 1	Level 1	Level 1	Level 1
degree of impact	high	high	high	high
<b>preparedness</b>				
prediction system	working at Level 1	not applicable	no	not applicable
vulnerability maps	existing	existing	existing at Level 2	existing
<b>alerts and warnings</b>				
procedures	working from Level 3 to Level 1	not applicable	working from Level 3 to Level 1	not applicable
efficiency	low	not applicable	upper-medium	not applicable
public perception	low	not applicable	upper-medium	not applicable
<b>response and search and rescue</b>				
procedures	Working from Level 2 to Level 3	locally designed	working from Level 2 to Level 3	working at Level 1
efficiency	upper-medium	low	high	high
public perception	upper-medium	no	high	upper-medium

Although Albania has dismantled its chemical weapons, some chemical materials stocked in controlled depots are still present in the country. The Nuclear Institute has adopted a set of measures in order to increase the monitoring and the risk assessment of this particular threat and specific Civil Protection action plans have been elaborated.

### 3.1.3 Human resources and costs

Thirteen people, comprising the General Director and the managers of the directorates, compose Albanian Civil Protection at central level in the Department of Civil Emergency, Planning and Response.

Each county and district comprises within their permanent staff a set of technicians (five or six for a county and one for a district). Each prefecture has a Civil Emergency Officer trained by a directorate using a standard two-stage Albanian civil emergency training manual. Each municipality and commune has a designated officer with responsibility for civil emergency matters who will have also benefited from instruction in the standard training curriculum and, quite possibly, through the frequent necessity

of observing early warning, standby and response protocol.

At *Level 2* and *Level 3*, Civil Protection in Albania is represented by a staff of 48 established at county level and 374 at district or commune level. There is only marginal voluntary participation in Civil Protection, with only the Red Cross Association of Albania able to deploy volunteers during an emergency phase.

The annual budget allocation for Civil Protection is comprised of the following funding sources:

- Local funds allocated by municipalities or communes (*Level 3*).
- Regional funds allocated by the prefects of counties (*Level 2*).
- Specific budget allocated by the Ministry of Interior (*Level 1*).
- Reserve funds allocated by line ministries and central institutions (*Level 1*).
- Reserve funds allocated by the Council of Ministers (*Level 1*).

Table 3.2: Human resources involved in Civil Protection in Albania.

HUMAN RESOURCES				
Level 1				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	~25	~15	~10	~25
% of the national active population	~0.0012	~0.0007	~0.0005	~0.0012
Level 2 and Level 3				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	~50 <sup>(A)</sup> +400 <sup>(B)</sup>	~400+50	no information available	~400 +50 + 480 <sup>(C)</sup> + 400 <sup>(D)</sup> +100 <sup>(E)</sup> +500 <sup>(F)</sup>
% of the national active population	~0.02	~0.02	-	0.092

Notes to Table 3.2:

- (A) Personnel employed in Civil Protection at Qark (county) level.
- (B) Personnel employed in Civil Protection at commune or district level.
- (C) Fire Brigade personnel at county and district level.
- (D) Private companies contracted by Civil Protection.
- (E) Forest Service personnel.
- (F) Albanian Red Cross personnel and volunteers.

Table 3.3: Average annual costs of the Civil Protection system in Albania.

ANNUAL COSTS							
Level 1							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of national Fire Brigade due to activities during 'emergency periods'	percentage cost of Albanian Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	~0.2	~0.1	~1.5	~0.25	no information available	no information available	~2
% of the national GDP <sup>(A)</sup>	~0.0013	~0.0007	~0.01	~0.0017	-	-	~0.013
Level 2 and Level 3							
	public servants involved in CP in 'peace periods'	private contracts involved in CP in 'peace periods'	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection		
euros (millions)	~4	no information available	no information available	no information available	~4		
% of the national GDP <sup>(A)</sup>	~0.027	-	-	-	~0.027		

Notes to Table 3.3:

- (A) The IMF's estimation of Albanian GDP in 2007 was about €15 billion, based on the 2006 figure.

Table 3.4: Albania: On-going cross-border activities.

Country	Status	Main Tasks
Croatia	In process	Border cooperation
France	Complete	Meteorological forecasting
FYROM	In process	
Germany	In process	
Greece	Bilateral Agreement	Fire-fighting
Montenegro	In process	Mutual aid
Italy	MOU Signed	Training, fire-fighting support
Turkey	In process	
Sweden	Through DPPI SEE	

Emergency financial support is guaranteed through the following funding sources:

- a. Emergency financial budget of communes, municipalities and counties.
- b. Ministry of Interior emergency budget.
- c. Other line ministries' emergency budgets.
- d. Reallocated budgets of line ministries.
- e. Council of Ministers reserve fund.

### 3.1.4 Civil Protection and society

In an attempt to increase civil preparedness, the General Directorate for Civil Emergency Planning and Coordination at *Level 2 and Level 3* prepares and distributes literature aimed at familiarising the public with the nature of the risks affecting communities.

Furthermore, the General Directorate has developed specific training curricula for Civil Protection personnel. Training activities are carried out yearly on the basis of national Civil Protection technical manuals or those adapted from international literature produced on the subject. To date, such training activities are not yet formalized or structured according to a national standard. The introduction of a Civil Protection National Training Centre could establish an institutional point of reference in this direction.

As referred to earlier, a Government decree recently transformed two former research institutes of the Albanian Academy of Sciences into departments of the Polytechnic of Tirana, with the aim of providing scientific support for the development of Albanian Civil Protection policy.

Consolidation of the knowledge base necessary for Albania to operate an effective Civil Protection system could help the country more effectively control the impact of major hazards. With this aim, the Institute of Energy, Water and Environment and the Institute of Geosciences could significantly improve their efficiency by focusing on aggregating historical data on meteorological, hydrological and hydraulic processes as well as geological and geotechnical ones, to rehabilitate their information networks and provide a foundation on which their capacities to observe and predict could be built. This would entail a programme of investment lasting at least five years.

In terms of cross-border activities, Albanian Civil Protection at *Level 1* is involved in a number of initiatives and international agreements in the field of Civil Protection, mainly focused on disaster preparedness. It is an active member of bodies including CMEP, SEESIM, DPPI-SEE, Black Sea Initiative, and EUR-OPA Hazard Agreement and actively pursues regional and cross-border cooperation.

A list of ongoing cross-border activities can be seen in Table 3.4.



## 3.2 Bosnia and Herzegovina

### *Public perception of Civil Protection*

The dramatic consequences of the long conflict in Bosnia and Herzegovina are still being felt by the people of this war-torn state. The widespread presence of unexploded ordnance, minefields and the hundreds of areas contaminated by depleted uranium are huge obstacles to growth and huge challenges to effective Civil Protection, especially to the most basic of State obligations: the duty to protect citizens and their right to be able to live safely, within the confines of their own territorial borders. Given the nature of the challenges that face this country, the development of effective Civil Protection structures is one of the foundation blocks upon which modern society is being built.

### *Demography and administration*

Bosnia and Herzegovina is a Federal Republic with a population of about 3.9 million people. The country has a complex political and administrative structure and there are several levels to consider. Following the Dayton peace agreement, signed in Paris in December 1995, a second tier of government was created when the country, which has an area of about 51,000 km<sup>2</sup>, was divided into two entities: the Republic of Srpska, representing 49 per cent of the territory, and the Federation of Bosnia and Herzegovina, representing 51 per cent. Each has its own administrative structure. In 1996, the Brčko Federal District, a 493 km<sup>2</sup> territory on the northern bank of the Sava river, was established after an arbitration process undertaken by the High Representative for Bosnia and Herzegovina.

The 10 cantons of the Federation of Bosnia and Herzegovina, and the seven regions of the Republic of Srpska, form the third level of the State of Bosnia and Herzegovina's political and administrative division. The fourth level is formed by the municipalities: 74 in the Federation of Bosnia and Herzegovina, and 63 in the Republic of Srpska.

Each of the two entities, the Federation of Bosnia and Herzegovina and the Republic of Srpska, is a *Level 1* administration, according to the definition introduced in

this review<sup>89</sup>, while the Brčko Federal District, the cantons of the Federation of Bosnia and Herzegovina and the regions of the Republic of Srpska are *Level 2*. The 137 municipalities are *Level 3* administrations.

### 3.2.1 Legislation

In terms of legislation, the Brčko Federal District and the two entities exercise a degree of autonomy from the State under which they have full independence when it comes to operational matters, and must be considered as separate units, but are under the mandate of the Ministry of Security of Bosnia and Herzegovina (*Level 1*) in matters including strategic planning, coordination and international cooperation.

The current legislation at State level is based on a set of laws defining the roles and the competences of all the administrative levels involved in Civil Protection.

The Law on Ministries and other Administrative Bodies in Bosnia and Herzegovina<sup>90</sup> transferred some Civil Protection competences from entity to State level. Accordingly:

- The State Ministry of Security has responsibility over the execution of international obligations and cooperation, coordination, and revision/approval of the entities' protection and rescue programmes and plans.
- The Ministry of Transport and Communications has to define strategic planning in the areas of international and inter-entity communications, transport, infrastructure and information technologies.
- The Ministry for Human Rights and Refugees is responsible for cooperation with the Red Cross Association, the International Red Cross Committee and humanitarian organisations.
- The Ministry of Civil Affairs is responsible for minefield clearance activities.

The Law on Ministries and other Administrative Bodies in Bosnia and Herzegovina also defines the procedures for approval of military assistance to civilian authorities in case of disasters, according to the authorisations of the State Presidency.

89 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

90 Official Gazette of Bosnia and Herzegovina, n. 5/03 and 45/06.

Other relevant existing legislation includes:

- The Law on Defence of Bosnia and Herzegovina<sup>91</sup>, which states that the Minister of Defence has the authority to engage military forces in case of disasters, upon a request from appropriate civilian bodies of Bosnia and Herzegovina or the entities through the Parliamentary Assembly.
- The Law on Mine Clearance in Bosnia and Herzegovina<sup>92</sup>, which regulates the organisational structure of mine clearance, and mine and unexploded-objects monitoring in the territory of Bosnia and Herzegovina. It also defines the bodies with competence for mine clearance, the rights and obligations of people who carry out mine clearance, and control of the execution of this law.
- The Law on the Red Cross Association of Bosnia and Herzegovina (RCA-BH)<sup>93</sup>, which defines the role and the competences of the Red Cross in cases of disaster caused by natural hazards, epidemics or other emergencies. The RCA-BH has authority over energy supply, border control, transport of people and goods, as well as broadcast of information.

There are several other laws promulgated by the Bosnia and Herzegovina State Parliament with potential bearing on the Civil Protection sector during emergencies<sup>94</sup>.

Legislation covering Civil Protection is currently undergoing major transition, from the current structure to a new framework of laws prepared with the support of UNDP and NATO. Of particular note is the Law on Protection and Rescue, covering people and assets in cases

of disasters caused by natural hazards, which was passed in May 2008. The law defines protection and rescue of people and material goods in cases of natural or other disasters in Bosnia and Herzegovina (BH), execution of international obligations and cooperation in the area of protection and rescue, namely Civil Protection, as well as authorizations of the BH institutions and coordination of activities of BH institutions and bodies, entity Civil Protection administrations and authorized Civil Protection body in Brcko District. The law prescribes the founding of the State Operation-Communication Centre and establishment of a Unique Emergency Number 112.

Other laws include the Law on Transport of Dangerous Substances in Bosnia and Herzegovina, and the Law on Environmental Protection, both of which are at an advanced stage of preparation.

The adoption of a new Law on Protection and Rescue in Bosnia and Herzegovina is critical for the whole structure of Civil Protection. It is worth observing that this law defines the roles of the Council of Ministers of Bosnia and Herzegovina, the Ministry of Security and the other ministries and administrative bodies involved in the planning and execution of Civil Protection activities, including protection and rescue. The law establishes the competences in the field of international obligations and international cooperation.

According to the new law a State Operational Communication Centre for monitoring, early warning and emergency management is to be established. Furthermore, emergency management will be in the form of an emergency number 112 National Operation Centre.

### 3.2.2 Civil Protection structure

Under the terms of existing legislation both State and entities have jurisdiction over their own Civil Protection structures. Entities are both financially and jurisdictionally autonomous from the State. Each level has its own specific mandate, with the State focusing on Civil Protection strategy while the entities focus on operational matters.

At State level the Sector for Civil Protection of the Ministry of Security is the *Level 1* body with competences in, and responsibility for, international

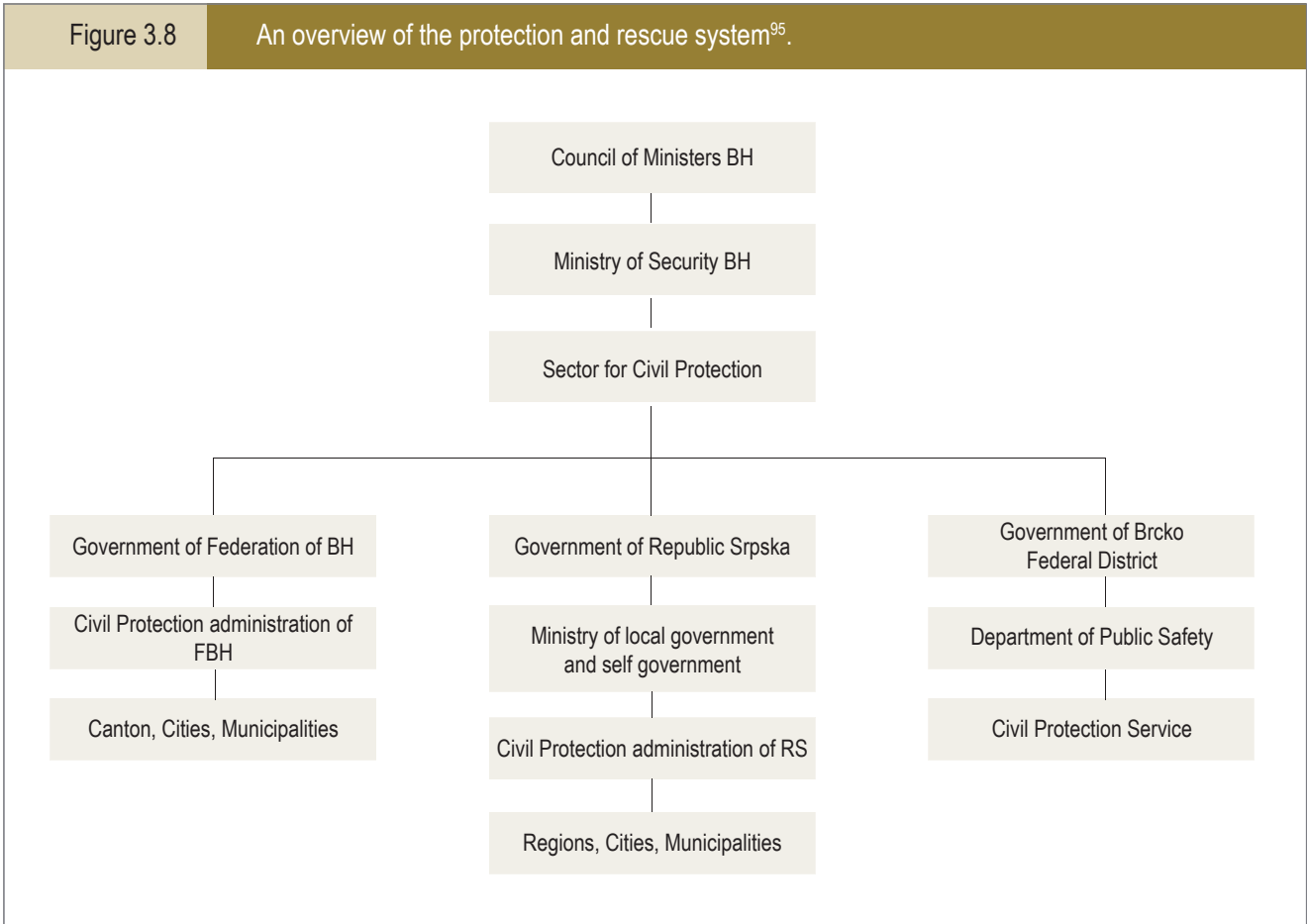
91 Official Gazette of Bosnia and Herzegovina, n. 88/05.

92 Official Gazette of Bosnia and Herzegovina, n. 5/02.

93 Official Gazette of Bosnia and Herzegovina, n. 49/04.

94 Other laws and programmes include: The Law on the Protection of Forests (OGBH, n. 23/03); the Law on Veterinary Science in Bosnia and Herzegovina (OGBH, n. 34/02); The Law on Food (OGBH, n. 50/04); the Law on the Implementation of the Convention on Prevention of Development, Production, Accumulation and use of Chemical Weapons and their Destruction (OGBH, n. 15/06); the Law on the Protection against Radiation and Nuclear Safety (OGBH, n. 88/07); the Bosnia and Herzegovina Strategy for Action against Terrorism (2006-2009); the Program of Protection against Chemical Weapons and Reaction in Case of Disaster and Incidents that include Chemicals (OGBH, n. 80/06).

Figure 3.8 An overview of the protection and rescue system<sup>95</sup>.



cooperation, internal coordination, strategic planning of protection and rescue measures and training programmes. Three departments have been established within the Sector:

- Department for Strategic Planning of Protection and Rescue Measures;
- Department for Structures and Training;
- Department of International Cooperation.

The Ministry of Security coordinates and manages planning and exchange of data and information, and reports on the risk reduction activities of entities and Brčko District.

The entities and Brčko District, within the framework of their competences in the area of protection and rescue, define, plan, train, organise, finance and execute protection and rescue with the aim of reducing risks and removing or mitigating the harmful consequences of disasters caused by natural or other hazards. In the

event of disasters, the Ministry of Security cooperates with the Red Cross Association and other humanitarian organisations to manage protection and rescue operations.

In February 2008 a protocol was signed with the Red Cross for cooperation over, and financing of, the development of protection and rescue units under the responsibility of the Red Cross through its 20 canton-based and 125 local units.

Other institutions and bodies at State level that work in the area of protection and rescue are obliged to plan and execute protection and rescue measures, and coordinate planning and execution of activities and assignments with the Ministry of Security.

Institutions and bodies at State level are obliged, upon a request from the Ministry of Security, to deliver data needed for the creation of risk assessments, and protection and rescue programmes and plans.

Integration of State-level and entity-level plans, and the plans of Brčko District, is done in coordination with the authorised bodies of entities and Brčko District.

95 Courtesy of the Federal Administration of Civil Protection, Federation of Bosnia and Herzegovina.

### Civil Protection administration in the Federation of Bosnia and Herzegovina

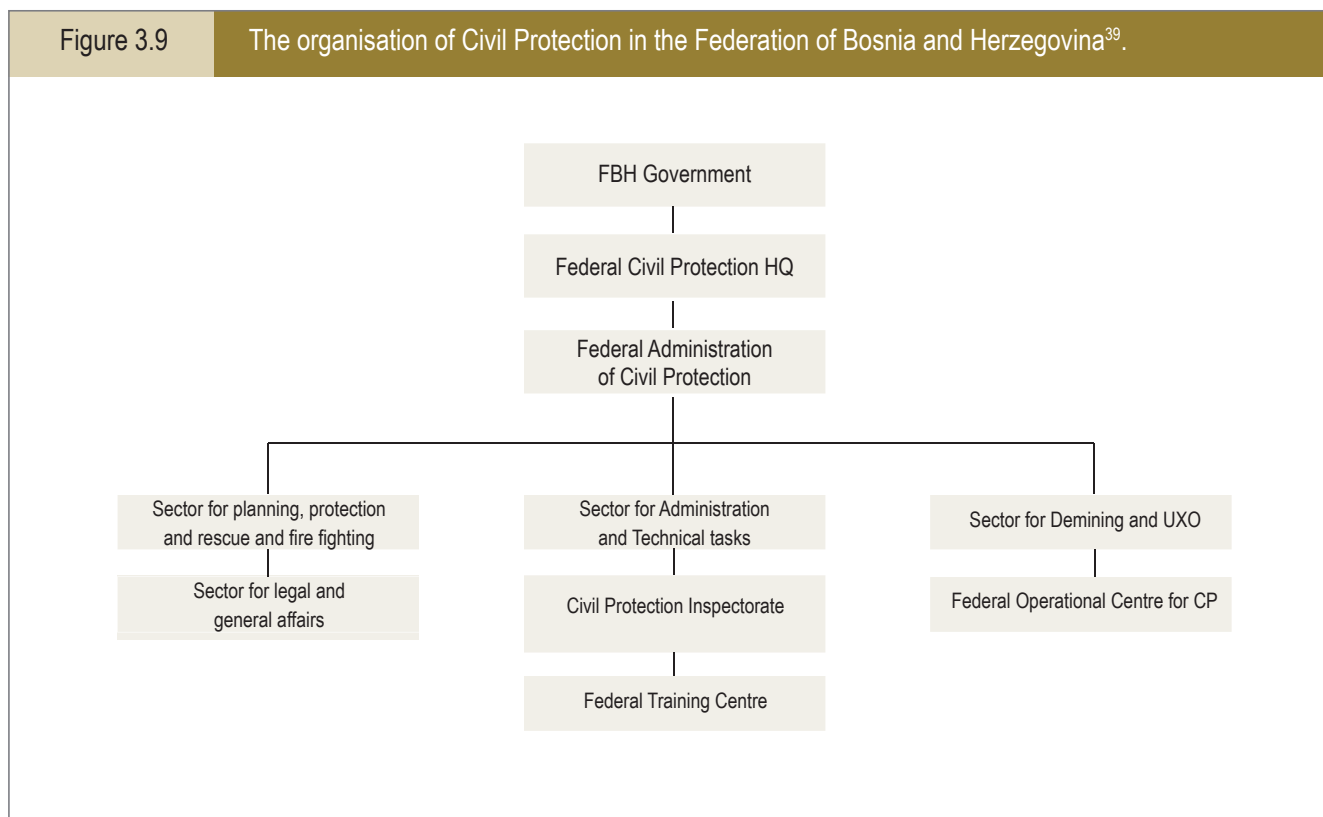
In 2003 the Parliament of the Federation of Bosnia and Herzegovina approved a law defining the protection and rescue system to provide a basis for disaster risk reduction and emergency management activities<sup>96</sup>. The law detailed the measures necessary for the protection and rescue of people, animals and property in cases of civil emergencies caused by natural hazards, accidents or conflicts.

The law was eventually amended in 2006 to comply with the structural reforms of the Bosnia and Herzegovinian defence system<sup>97</sup>, establishing the legal preconditions for the organisation of a unique protection and rescue system for the Federation. Based on the law, 25 legal regulations were issued by the Federation Government, Federal Administration of Civil Protection and other Federal Ministries. The law obliges each canton to establish its own legislation covering protection and rescue activities, and invests municipalities and cities

with the competence to establish legal regulations covering the organisation of protection and rescue at their level.

The Civil Protection structure in the Federation of Bosnia and Herzegovina reflects the administrative organisation of the entity, which is particularly complex and decentralized due to its three-tier administrative system of Federation, cantons, and municipalities or cities. Each level has the constitutional authority to make regulations and to determine matters in all areas of society, including protection and rescue.

Since 2000 the authority in overall charge of protection and rescue has been the Federal Administration of Civil Protection, which is under the authority of the Federation Government. The Federal Administration has a number of sectors with duties and mandates relevant to the management of civil emergencies. Figure 3.9 shows in some detail a scheme of the actual organisation of Civil Protection in the Federation.



96 Official Gazette Federation Bosnia and Herzegovina n. 39/03 and n. 22/06.

97 Official Gazette Federation Bosnia and Herzegovina n. 22/06.

98 Courtesy of the Federal Administration of Civil Protection, Federation of Bosnia and Herzegovina.

In common with municipalities, federal and cantonal operational centres operate on 24-hour shifts when an emergency is declared. Teams are usually based on a staff of five. Private companies and other registered bodies and associations can provide municipalities or cantons with specific protection and rescue services, including those relevant to medical, veterinary, chemical and biological emergencies, the monitoring of radioactivity, and emergencies requiring divers.

In terms of assets, the general estimation of the Civil Protection equipment situation at Federal level is that significant capacity gaps exist. A large percentage of the resources available by 1992 were destroyed, damaged, broken, taken away or were already obsolete. Operational centres at canton and municipal level generally suffer from a lack of basic equipment, such as computers, software and wireless communications in case of telecommunications or power failures. Protection and rescue services and other general and specialist Civil Protection units tend to be insufficiently equipped and trained. The only sector moderately equipped with resources is the Fire Brigade.

The meteorological monitoring network operational in Bosnia Herzegovina<sup>99</sup> has been significantly cut since the war and is now limited to just 11 synoptic stations meeting the UN World Meteorological Organization (WMO) standards and six climatological stations. Observations from the synoptic stations are collected via the public switched telephone network every three hours. Only few and isolated stations still use radios to communicate data. After validation and elaboration of the data a set of meteorological reports is periodically sent to WMO.

At the beginning of 2005 two satellite retrieval systems were installed at the Meteorological Institute: the French RETIM 2000<sup>100</sup>, and the Norwegian MEOS MSG. RETIM 2000 is used for the reception of different products elaborated by Meteo France as the outputs of numerical models ARPEGE, ALADIN and Bracknell. The MEOS system is used for reception of EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites) products from

99 Bosnia and Herzegovina Federal Meteorological Institute - <http://www.fhmzbih.gov.ba/>

100 The RETIM 2000 receiver is a router satellite dedicated to the receipt of meteorological data disseminated by Météo-France's new RETIM 2000 central system. This receiver is different from its predecessor (RETIM 88) in that its reception capabilities are far superior (up to 2 MB/second) and the satellite data is disseminated to the general public by using DVB as standard.

the MSG (Meteosat Second Generation) satellite. Full access to this data has been granted from EUMETSAT.

### *Civil Protection administration in the Republic of Srpska*

In 1997 the Parliament of the Republic of Srpska promulgated the Law on Civil Protection and the following year Civil Protection competences were transferred from the Ministry of Defence and organised in accordance with changes and amendments to the Law on Ministries. In 2002 Civil Protection was placed under the umbrella of the Ministry of Local Governance, also in accordance with the Law on Ministries, and a new Law on Civil Protection was promulgated. In 2003 certain changes and amendments to the Law on Civil Protection were adopted.

The Law states that the Republic's Civil Protection Administration has competences for planning; the issuing of obligations regarding the lending of material resources for Civil Protection needs; and damage assessment directives. The Director of Civil Protection is responsible for the administration and the organisation of the entire structure, as well as for the training programmes for Civil Protection units.

In 2006 a working group was appointed by the Ministry of Local Governance to prepare a draft of a new Law on Civil Protection.

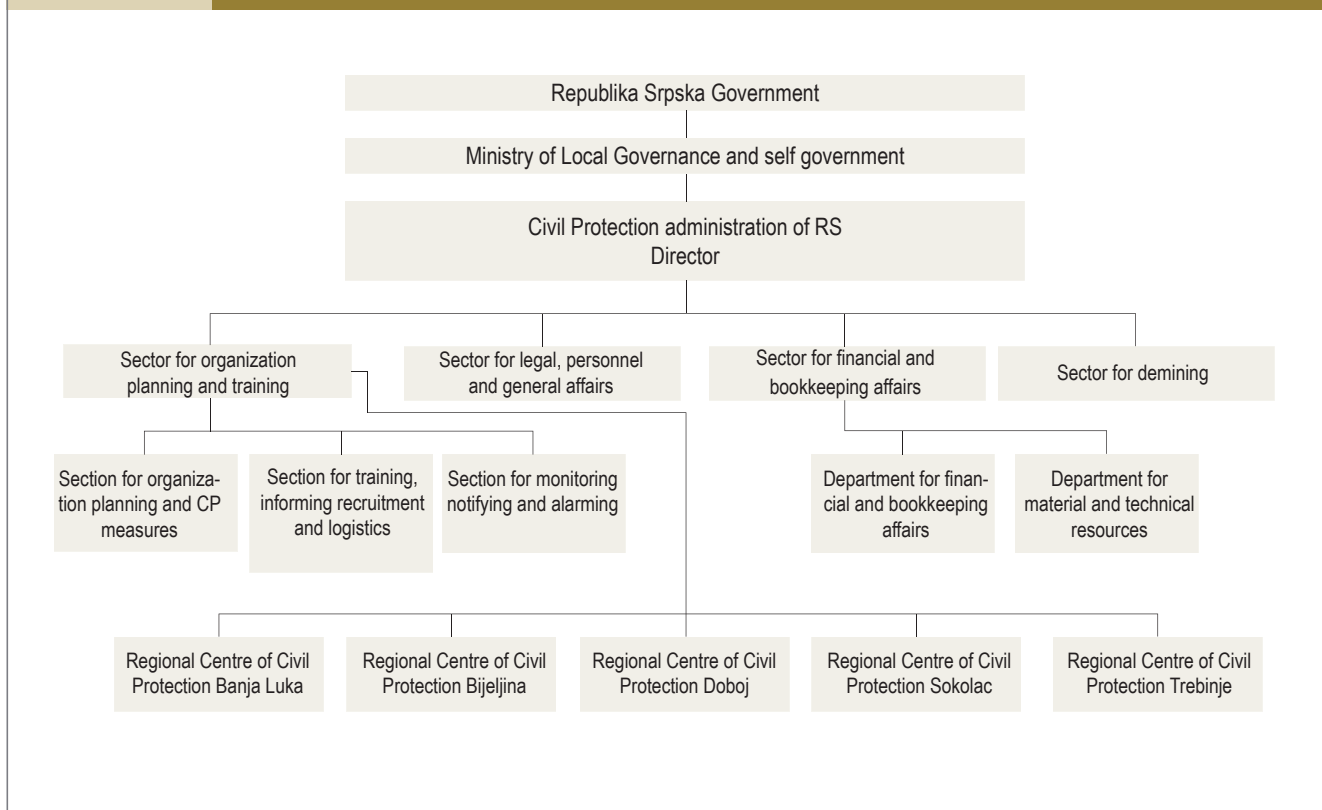
Figure 3.10 shows in some detail the overall organisation of Civil Protection in the Republic of Srpska.

The structure of Civil Protection comprises four sectors:

- Sector for organisation, planning and training (three sections);
- Sector for financial and book-keeping affairs (two departments);
- Sector for de-mining activities;
- Sector for legal affairs, personnel and general affairs.

The Civil Protection Headquarters is responsible for the overall management of protection and rescue activities in the Republic. The Prime Minister of the Republic has the role of Headquarters Commander, while the Local Governance Minister occupies the role of Deputy Commander, and the Civil Protection Director is the Chief.

Figure 3.10 The organisation of Civil Protection in the Republic of Srpska<sup>101</sup>.



Five regional centres and Civil Protection units have been established for the regions of Banja Luka, Bijeljina, Doboj, Sokolac and Trebinje (*Level 2*). The regional units have been established in order to provide the Republic with a more rational scheme during emergency phases.

The Civil Protection units are operational forces responsible for specific tasks, such as first-response, protection and rescue, evacuation and sheltering, post-disaster restoration and the enforcement of law and order.

At town/municipal level (*Level 3*) the local Civil Protection centres are fully responsible for protection and rescue activities in their territories. The town mayor or head of municipality becomes the Civil Protection headquarters commander. At the level of town/municipality several Civil Protection services have been established, coordinated by regional Civil Protection Units. The manager of the town/municipality Civil Protection service automatically becomes the chief of the local Civil Protection headquarters. The services under the authority of the mayor/head of municipality

have most responsibility at operational level. The main document detailing Civil Protection in the Republic of Srpska is the Plan of Civil Protection. It provides a Plan of Preparedness Measures, a Plan of Mobilization, an Operational Plan and a Plan of Communications with an overview and contact details of organisations, services and personnel.

In case of a severe emergency the Republic Government can declare a state of emergency covering the whole Republic. A similar procedure has been defined for the mayors of towns or the presidents of municipalities in cases of local emergencies. Following the declaration of a state of emergency the Civil Protection Headquarters assumes responsibility for operations, managing protection and rescue activities. All citizens are obliged to act in accordance with regulations once a state of emergency has been declared.

Local hydrometeorological and seismological institutes are actively involved as monitoring operations, providing Civil Protection Headquarters with daily reports on emergency situations, alerts and forecasting. During emergencies the local institute director is

101 Courtesy of the Federal Administration of Civil Protection, Republic of Srpska.

relocated to the local headquarters. A reasonably dense network of sensors is operational in the Republic and incorporated into the Civil Protection system<sup>102</sup>.

### *Civil Protection administration in Brčko District*

Brčko District has a population of 100,000 people, representing approximately 2 per cent of the total population of Bosnia and Herzegovina. No specific laws on Civil Protection have been adopted by the District and current legislation on the subject refers to that of the Federation and the Republic.

The Brčko District Civil Protection structure has been established under the authority of a Sub-Department of Public Safety and encompasses three main sections: the Civil Protection Section, responsible for the de-mining programme; the Fire Department; and the Information Section.

Municipality mayors command operations in the event of emergencies, while the role of head of Civil Protection is performed by the Director of the Department of Public Safety. He/she makes use of the 24-hour Banja Luka monitoring centre for operational needs, especially with reference to flood risk assessments relevant to flood-prone areas of the river Sava.

### *Exposure to hazards*

Bosnia and Herzegovina lies on the Mediterranean trans-Asiatic seismic belt. Several powerful earthquakes have struck over the centuries, and in recent years, causing considerable damage, injury and death. Monitoring is carried out by the Geophysical Institutes of the two entities and both provide a reliable service, despite being hindered by a network with an obsolescence problem and the destruction of the seismological station of Banja Luka during the war.

As well as the threat of earthquakes the country is also at risk of flooding, primarily from the river Sava. The Sava basin covers 74 per cent of the country, while the Adriatic basin covers the remaining 26 per cent. In all about 2,500 km<sup>2</sup> of the total territory is prone to flooding and the

Department of Public Safety has an operational plan in place to cope with the threat.

The flood protection infrastructure, including embankments, pumping stations and dams, is generally inadequately maintained, with some facilities having suffered serious damage during the war. Monitoring structures are established at local level and include a certain number of measuring stations, equipped with hydrometers and rain gauges, which operate on the main rivers. However, there is an urgent need for innovative technological development in this area including the introduction of new equipment and solutions capable of providing Civil Protection decision-makers with reliable data models relevant to expected risk scenarios.

The complex topography of the country makes landslides a common occurrence and one which imposes significant costs on local administrations charged with the task of repairing or reconstructing damaged assets such as road networks.

Wildfires represent a further hazard; they are frequent during the summer season and the risk of outbreaks extends throughout the dense and extended forest areas, which cover 50 per cent of the territory.

The exposure of the country to the risk of disasters caused by natural hazards is summarised in Table 3.5, along with mitigation measures.

Minefields and unexploded ordnance, a remnant of the 1992-1995 war, represents the major technological hazard facing Bosnia and Herzegovina. A recent report<sup>103</sup> estimates that about 700,000 mines and 650,000 pieces of unexploded ordnance are spread over a 2,000 km<sup>2</sup> area, comprising 4 per cent of the entire territory. To compound the problem some of the areas containing mines and ordnance are also at risk of flooding, which can dislodge the potentially lethal explosives causing additional hazards. Since 1995 mines and unexploded ordnance have killed more than 1,600 people. Such is the degree of risk that Civil Protection authorities have established a specific sector to tackle mine clearance. Significant resources, international cooperation and a great deal of the work of Civil Protection authorities are being devoted to achieving a solution to this critical issue.

102 Information provided by the Director of Civil Protection.

103 Italian Foreign Affairs Ministry, *Cooperazione Italiana allo Sviluppo Sarajevo*, 2006.

Table 3.5: Risk exposure and organisation in Bosnia and Herzegovina.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with event	Level 1	Level 1	Level 1	Level 1
degree of impact	high	high	high	high
<b>preparedness</b>				
prediction system	working at Level 1	not applicable	no	not applicable
vulnerability maps	existing at Level 2	existing at Level 2	existing at Level 2	existing at Level 2
<b>alerts and warnings</b>				
procedures	Level 1	not applicable	Level 1	not applicable
efficiency	upper-medium	not applicable	upper-medium	not applicable
public perception	upper-medium	not applicable	upper-medium	not applicable
<b>response and search and rescue</b>				
procedures	Level 1	Level 1	Level 1	Level 1
efficiency	low	low	high	high
public perception	low	no	high	upper-medium

### 3.2.3 – Human resources and costs

At State level almost 20 people are employed by the Sector for Civil Protection, although this number is expected to double following the issuing of the new Law on Protection and Rescue and the establishment of the National Operation Centre (112).

The Federation of Bosnia and Herzegovina Civil Protection Headquarters is based on a staff of 20 public servants, while the 10 cantonal headquarters employ a total of 120 people.

There are about 150 personnel employed at central level in the Republic of Srpska, of which 45 are civil servants, 15 are temporary employees and 90 are contracted to work in the mine clearance programme. About 100 people are employed at municipal or town level.

In Brčko District a total of around 300 people are involved in Civil Protection, mainly in professional operational units engaged in areas such as fire-fighting, decontamination work, the clearance of mines and unexploded ordnance, and delivering emergency medical and veterinary assistance.

In terms of finance the commitment at State level is relatively small, with the Sector for Civil Protection of the

Ministry of Security allocating about €0.25 million per year. Other State-level commitments include the 2009 to 2011 Strategy of Development of the Ministry of Security, which contains a proposed €2.8 million for the improvement and development of the protection and rescue system at State level through implementation and harmonization of the Law on Protection and Rescue.

By statute entities and Brčko District finance all Civil Protection activities that they plan and organise. Consequently, the financing of protection and rescue structures and operations is channelled through Federation, cantonal and municipal budgets, and from a tax on workers employed on temporary contracts amounting to 0.5 per cent of their net salaries<sup>104</sup>.

The annual budget for Civil Protection allocated by the Federation is about €5 million, including the funds obtained from the tax on net salaries. The budget is used mainly to enhance preparedness at Civil Protection Headquarters through the provision of equipment and training, for protection and rescue services and units, and for mitigation activities.

104 Article 180. Law on Protection and Rescue.



Table 3.6: Human resources involved in Civil Protection in Bosnia and Herzegovina.

HUMAN RESOURCES				
Level 1				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	~20-40	no information available	no information available	~20-40
% of the national active population	~0.0009			~0.0009
Level 2 and Level 3				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	~590	~420	~170	~590
% of the national active population	~0.013	~0.009	~0.0037	~0.013

Table 3.7: Average annual costs of the Civil Protection system in Bosnia and Herzegovina.

ANNUAL COSTS							
Level 1							
	public servants involved in CP in 'peace periods'	private contracts involved in CP in 'peace periods'	percentage cost of Fire Brigade due to activities during 'emergency periods'	percentage cost of Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	0.3	no information available	N/A	N/A	~1	no information available	~1.3
% of the national GDP	0.0014	-	-	-	~0.0045	-	~0.006
Level 2 and Level 3							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	operational cost of equipment, technologies and emergency assets		average annual cost of post-emergency recovery	total funding for Civil Protection	
euros (millions)	~3	no information available	~3.5		no information available	~7	
% of the national GDP	~0.014	-	~0.016		-	~0.032	
research and development							
	investments in universities, research agencies	maintenance for universities, research agencies			public or private companies supplying hardware and software		
euros (millions)	N/A	N/A			N/A		

Brčko District allocates approximately €1.5 million for Civil Protection equipment and protection services, and €1.0 million for salaries. A further €3.5 million has been allocated for activities to regulate the flow of the Sava river, including the building of pumping stations and the restoration of damage caused by previous flooding.

### **3.2.4 Civil Protection and society**

Competences in the area of education have been transferred to the entities and Brčko District, with the Ministry of Civil Affairs acting as coordinating body.

The Ministry of Security of Bosnia and Herzegovina pays great attention to cooperation with scientific institutions, especially with academia involved in studies into deviant behaviour. The intention is to prepare the Civil Protection sector for new threat scenarios, such as those posed by acts of terrorism.

In terms of cross-border activities, Bosnia and Herzegovina actively cooperates with a number of countries on Civil Protection issues. In 2001 a cooperation agreement was signed with the Government of the Republic of Croatia on disaster risk reduction. Standard operational procedures for cross-border assistance in case of wildfires were established between the Protection and Rescue Directorate of the Republic of Croatia and the Ministry of Security of Bosnia and Herzegovina. Other bilateral cooperation agreements include:

- Memorandum of Understanding signed in November 2006 with the Danish Emergency Management Agency on the protection and rescue of people and assets in cases of disasters caused by natural or other hazards.

- Cooperation Agreement signed with the Government of Montenegro in September 2007 on the protection in cases of disasters caused by natural or other hazards.
- Cooperation Agreement signed with the Government of the FYR of Macedonia in March 2008 on protection in cases of disasters caused by natural or other hazards.

The following agreements are currently under development:

- Cooperation Agreement with the Republic of Serbia.
- Memorandum of Understanding on the Institutional Framework of the Disaster Preparedness and Prevention Initiative for South Eastern Europe.
- Memorandum of Understanding on facilitation of border crossing for civil convoys of international aid.
- The Civil Protection sector of Bosnia Herzegovina participated in the international protection and rescue exercise IDASSA 07 held in the Republic of Croatia, with a mixed medical assistance unit.

Further joint activities and exercises are planned within EU Civil Protection policy and NATO policy.

### 3.3 Bulgaria

#### *Public perception of Civil Protection*

Civil Protection is considered a primary responsibility of the State in the Republic of Bulgaria and the rights of individuals to receive protection in the event of emergencies is enshrined in legislation. The Government is responsible for protecting people and assets in emergency situations and for the organising of population preparedness and Civil Protection forces in order to conduct operations in the event of an emergency.

The Council of Ministers of the Republic of Bulgaria elaborates the State policy in the area of Civil Protection and protection of the population in case of disasters.

Following the devastating floods of 2005 the Government defined Civil Protection and disaster risk reduction as a key priority and initiated a profound reform of the Civil Protection system in Bulgaria; the Disaster Protection Act was adopted, the State Agency for Civil Protection was dissolved and the Ministry of State Policy for Disasters and Accidents (recently renamed to Ministry of Emergency Situations) was established.

The Disaster Protection Act states that the citizens of the Republic of Bulgaria, foreign nationals and stateless persons residing in the territory of the Republic have, in emergency situations, the right to protection of their life and health through material and financial assistance provided either by individual or collective means.

The fundamental principles of disaster protection in Bulgaria, as defined by the Disaster Protection Act, are:

- right of each person to protection;
- priority of human life rescue activities over other protection activities;
- ‘public character’ of any information regarding disaster risks and regarding executive authorities’ activities, aimed at disaster protection;
- priority of preventive measures while ensuring protection;
- specified responsibilities for implementation of protection measures;

- phased provision of forces and resources for the needs of protection.

Moreover, each citizen has the right, as well as the obligation, to be trained in protection and rescue and has the right to receive full and timely information about all threats of disaster, as well as all available protection measures and activities.

The Disaster Protection Act introduced a detailed set of rules covering the organisation of activities to prevent accidents, emergencies and disasters, or mitigate their consequences.

#### *Demography and administration*

The population of Bulgaria is about 7.6 million people, giving it an order of magnitude of *Level 1* according to the classification used in this review<sup>105</sup>. Bulgaria covers a territory of 110,000 km<sup>2</sup> and is divided into 28 administrative districts (regions – *oblast*) and the municipality of Sofia (with a population of 1.3 million), which is its own administrative unit (see Figure 3.11).

Each district has its own Civil Protection regional directorate (*Level 2*) included in the National Civil Protection Service. Twenty eight professional rescue teams operate under each of the 28 regional directorates.

The country is further subdivided into 264 (*Level 3*) municipalities (see Figure 3.12), each with its own local council and headed by a mayor. Each municipality has a local committee for emergency situations, with the mayor as chairperson.

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<sup>105</sup> The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

Figure 3.11

Administrative divisions of Bulgaria: 28 districts (regions), the brown region represents the capital, Sofia.



Figure B

Geographic deployment of Civil Protection Regional Directorates and Rescue teams.

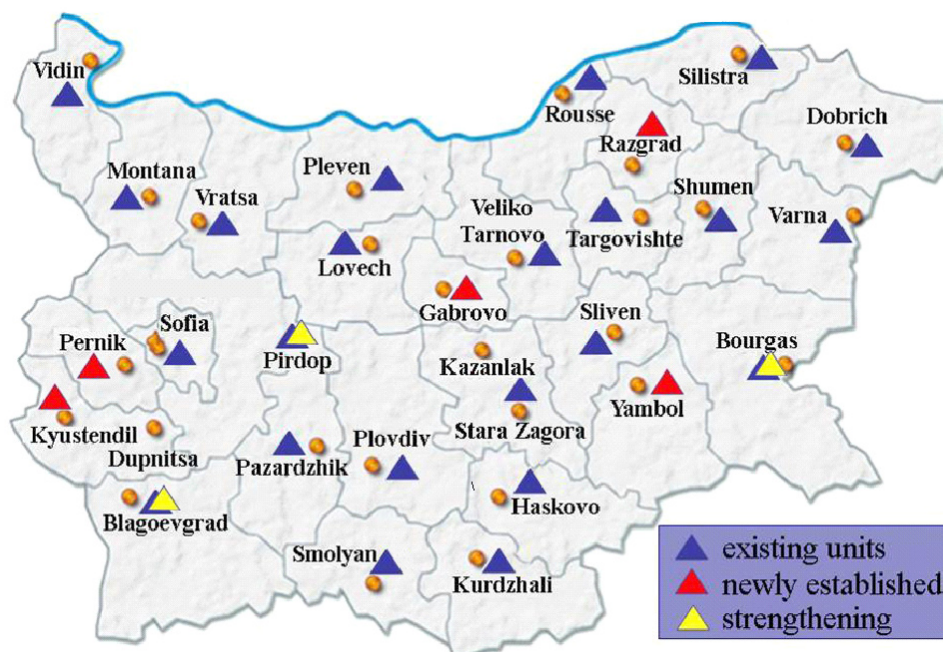
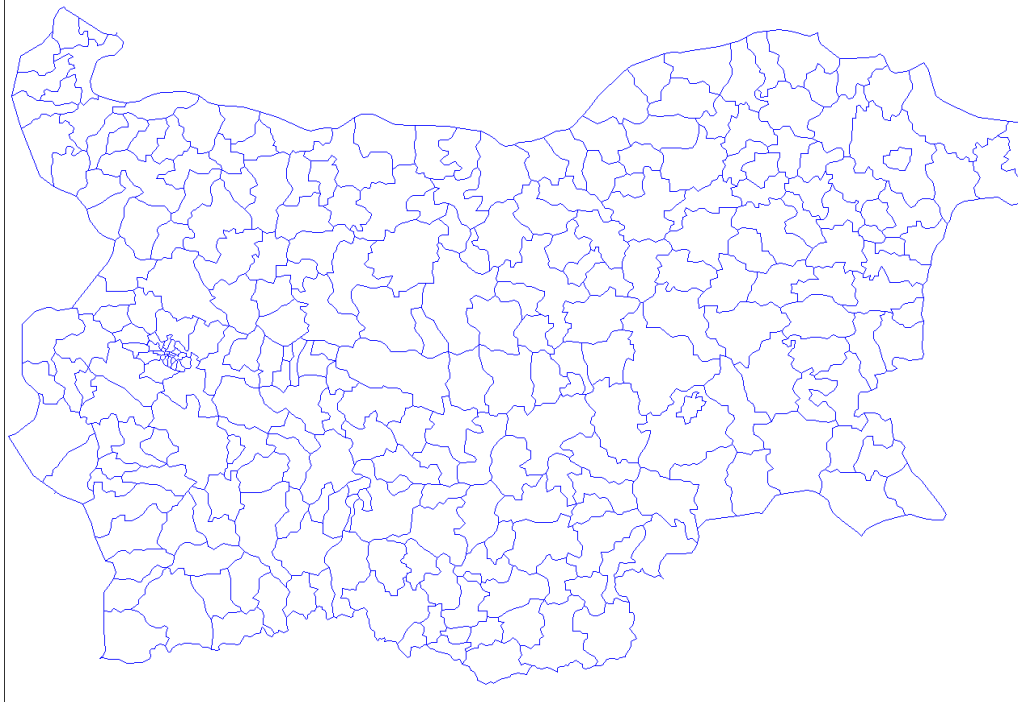


Figure 3.12

Administrative divisions of Bulgaria: 264 municipalities.



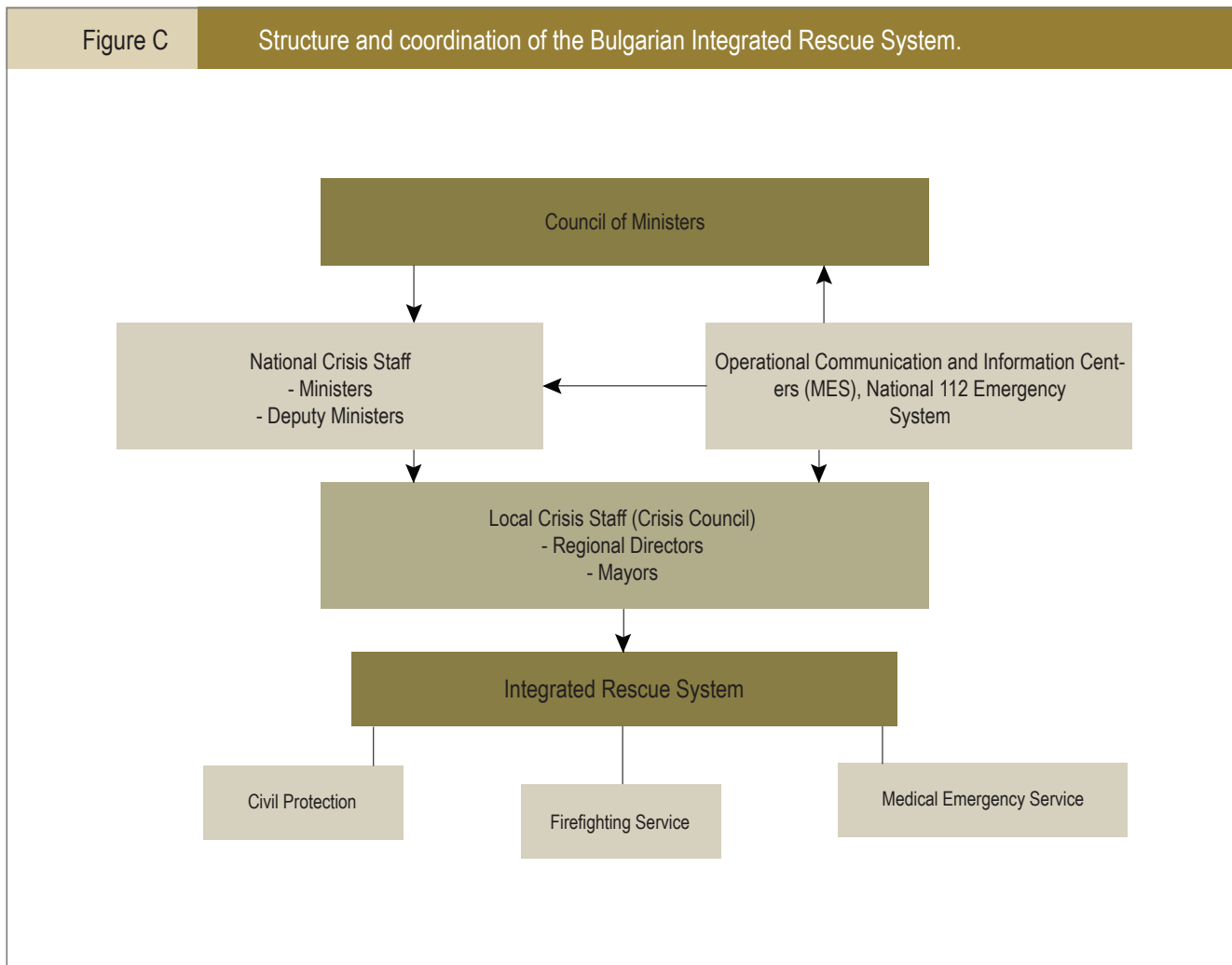
### 3.3.1 Legislation

Civil Protection legislation is based on the Supreme Law of the country: the Constitution of the Republic of Bulgaria. The Civil Protection system is regulated by the following legislation:

- Disaster Protection Act.
- Crisis Management Act.
- 112 Act.
- Local Administration Act.
- Waters Act.
- Defence and Armed Forces Act.
- Ministry of Internal Affairs Act.
- Public Health Act.
- State Administration Acts.
- Other special laws.
- Related secondary legislation.

The main legislative act is the Disaster Protection Act, adopted in 2006, which established the regulations covering the duty to preserve life and health, and protect the environment and property in the event of a disaster. The Disaster Protection Act stipulates the activities related to the coordination and management of the rescue and emergency recovery efforts among the competent authorities – components of the created Integrated Rescue System – which have to work together in the event of disaster and form units of the unified rescue system.

The Disaster Protection Act regulates: the scope of, and the entities responsible for carrying out, preventive measures and activities; the Integrated Rescue System for disasters protection and the coordination between the institutional bodies and legal authorities; the coordination and leadership of the rescue and urgent emergency recovery activities carried out in the area of disaster management and the participation and cooperation of people, including those in the legal profession and sole

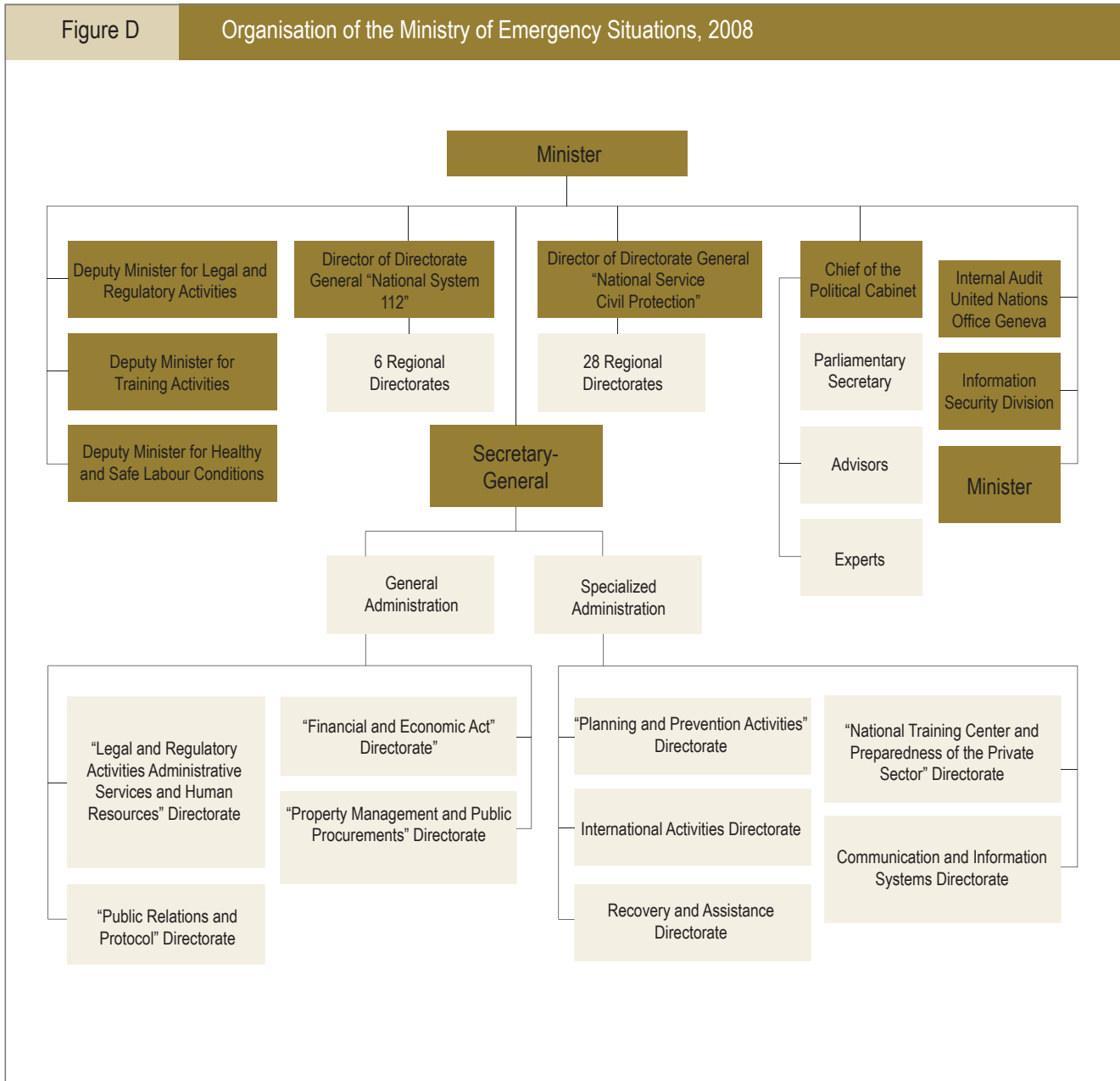


traders, in case of disasters; the creation of volunteer units; and the competent authorities for the carrying out of training of executive authorities, managerial bodies on a central and local level, and other target groups among the population.

The Integrated Rescue System denotes the organisation, coordination and direction of the activities of units, services and other operational structures in the process of preparation for response to disasters, in the event of the occurrence of disasters, and in case of the need to conduct simultaneous rescue and emergency repair and recovery by one or more of its components or units. The Integrated Rescue System is in charge of the organisation, coordination and management of the units' activities; the preparedness structures and services and the conducting of rescue and emergency recovery activities in the event of disaster, including simultaneous activities of two or more units or service

The principal components of the Inegrated Rescue System are the National Civil Protection Service Directorate General of the Ministry of Emergency Situations; the National Fire Safety and Protection of the Population Service of the Ministry of Interior; and the National Medical Coordination Centre and the Emergency Medical Aid Centres of the Ministry of Health. These bodies guarantee constant readiness to receive messages, evaluate situations and immediately act in the event of an emergency. The other component of the Integrated Rescue System involves rescue and recovery activities, which can involve the Armed Forces by order of the Minister of Defence should a demand be made by a respective State body that is in compliance with regulations covering rescue and emergency recovery.

With a resolution of the National Assembly the Ministry of State Policy for Disasters and Accidents (MSPDA) was established in 2006 as a legal successor of the State Agency for Civil Protection, established 72 years ago.



In 2008 the Ministry was renamed the Ministry of Emergency Situations (MES).

The MES undertakes all Civil Protection activities in the event of disasters. The Ministry develops and implements new and modern techniques so as to coordinate the efforts of the executive administration and other bodies of governance, as well as legal entities, NGOs and sole citizens in order to create an effective model for actions in the event of disasters.

Civil Protection in Bulgaria benefits from a comprehensive legislative framework, from the implementation of an efficient early-warning system and

from the many collaborative initiatives between the academic community and national and local research institutions involved in disasters prevention.

### 3.3.2 Civil Protection structure

The Ministry of Emergency Situations is organized into 9 Directorates (5 Directorates are part of the Specialized Administration and the other 4 are General Administration) and 2 Directorates General: the National 112 System Directorate General, with 6 territorial units, and the National Civil Protection Service Directorate General, with 28 territorial units.

The Specialized Administration involves the National Civil Protection Service Directorate General, along with the following directorates: Planning and Prevention Activities; National Training Centre and Preparation of Private Sector; Communication and Information Systems; International Affairs; and Recovery and Assistance.

The Civil Protection regional directorates, under the National Civil Protection Service Directorate General, are territorial units located in each of the 28 districts.

The main goal of the MES is the establishment of an effective, efficient, technically adequate and materially integrated system for prevention, preparedness, management and recovery in case of disasters. Towards achieving this goal the Ministry gives central attention to prevention, training and response to disasters.

Disaster prevention policies denote a comprehensive range of activities, such as planning of disaster protection, implementation of preventive measures for the exclusion or mitigation of disaster consequences, and preventive control etc. The regulatory framework for prevention and mitigation activities is provided by the Disaster Protection Act, which covers the organisation, major functions and tasks of national (*Level 1*), regional (*Level 2*) and local (*Level 3*) administrations, companies and private contractors with regard to disaster risk reduction activities.

The aims, priorities and tasks of the prevention activities are set in the National Program for Protection of Disasters, adopted by the Council of Ministers. The Program includes an organised and coordinated series of plans covering *Level 1*, *Level 2* and *Level 3*, targeting disaster prevention and mitigation, and includes specific procedures for immediate relief including the provision of temporary supplies of drinking water, food and other means of survival necessary to regions affected by disaster. It also includes the study of potential hazards across the territory, each of which will be categorized and a prognosis provided regarding how to manage it.

The Minister of Emergency Situations develops the Program as well as annual plans for its implementation, together with the Ministries, the National Association of Municipalities in the Republic of Bulgaria and the Bulgarian Red Cross. Planning of disaster prevention is carried out at municipal, regional and national level.

Preventive measures for disaster risk reduction include the establishment and/or modernization of systems for monitoring, forecasting and early warning.

In this context the MES in 2007 established a specialized monitoring structure within the Communications and Information Systems Directorate, namely the Aerospace Monitoring Center (ASMC). It is the first satellite data receiving centre in Bulgaria. ASMC provides support in the process of discovery, monitoring, risk assessment and management of natural hazards and disasters caused by technological hazards, and emergency situations.

The centre is equipped with two ground stations for receiving and processing satellite data in real-time (direct broadcast) from the meteorological satellites NOAA (AVHRR) and Feng-Yun (MVISR), and the NASA Earth observation satellites – TERRA and Aqua. The satellite images have a spatial resolution of 250, 500 and 1,000 m. The different satellites have different applications in disaster studies as well as in different stages of the risk management process. In addition ASMC receives satellite images from the Disaster Monitoring Constellation (DMC) via the internet.

The Ministry performs assessment and keeps a register of the critical infrastructure and is connected in the Critical Infrastructure Warning Information Network (CIWIN) system of the EU. It exchanges information with the EU member states and third countries through the CECIS, STESTA and RODOS systems, and the early-warning system for disasters and accidents in the basin of the Danube etc.

Another key focus of the prevention policy is the training and education of the central and territorial executive authorities, the response forces and the population.

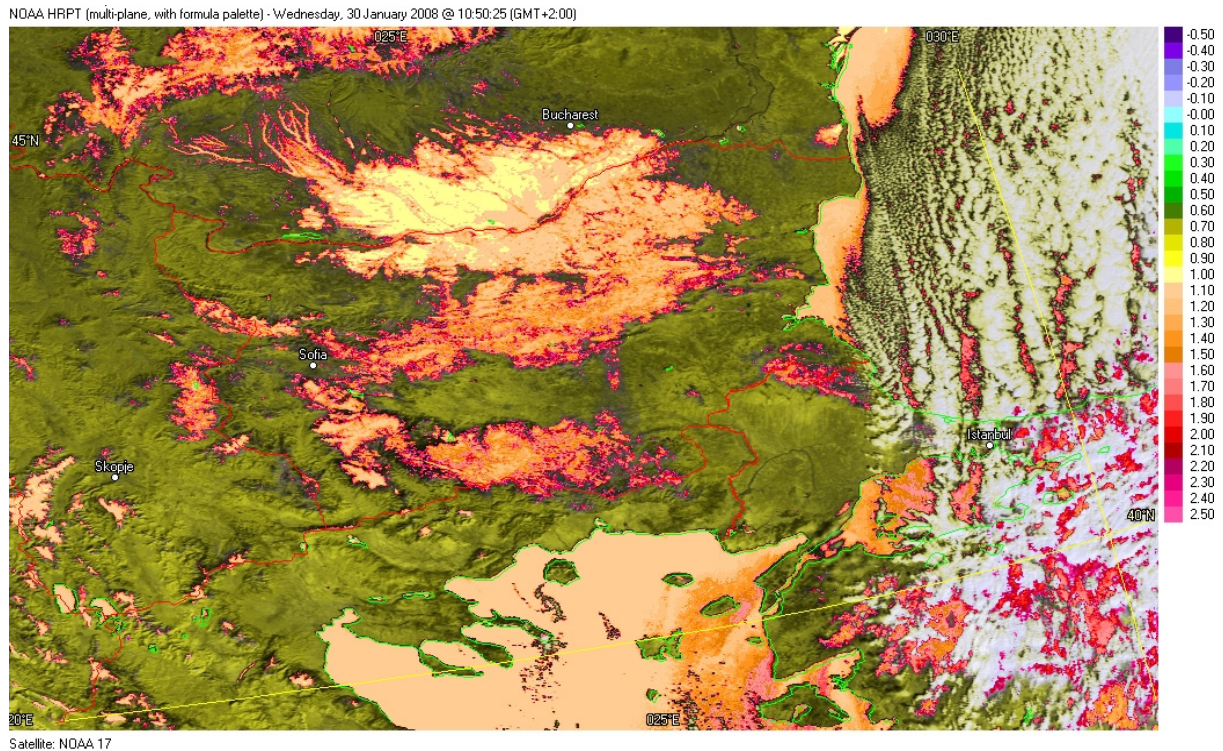
Disaster protection entails a set of policies and measures related to ensuring coordination of the components of the Integrated Rescue System as well as to maintaining a high level of preparedness for rescue and recovery operations in case of emergency.

In order to ensure the coordination of the institutions within the Integrated Rescue System the MES established 28 Regional Communication and Information Centres. These centres receive and evaluate the information about emerging disasters or accidents and monitor the process of gaining control over them. They inform the relevant institutions and coordinate the activities of the components of the Integrated Rescue System.



Figure E

Satellite image of the forest fires in Bulgaria in 2007.



Another coordinating body is the Situational Centre of the MES, which is operational 24/7/365 and keeps constant contact with all national and international partners in case of disaster.

In this framework it is important to mention that the MES, in accordance with the obligations regarding telecommunications and information technologies of the Accession Treaty, has established a National 112 Emergency System. The system has been fully operational nationwide since 30 September 2008. The National 112 Emergency System currently employs 405 operators and specialists.

The system's parameters are set up in accordance with the requirements of Directive 2002/22/EC of the European Parliament and of the Council of March 2002 on universal service and users' rights relating to electronic communications networks and services.

The main purpose of the National 112 Emergency System is to provide to Bulgarian citizens and foreign visitors fast and free-of-charge access to Police, Fire Brigade, Civil Protection and Ambulance services, by using the single European emergency call number 112.

The 112 system in Bulgaria is structured in six call centres; one per economic region. The centres are interchangeable and each serves the corresponding economic region. The system is homogeneous across the country, which enables each 112 centre to accept calls from any geographical point. The system facilitates the location of the calling party to be identified and provided to the call takers in the centres.

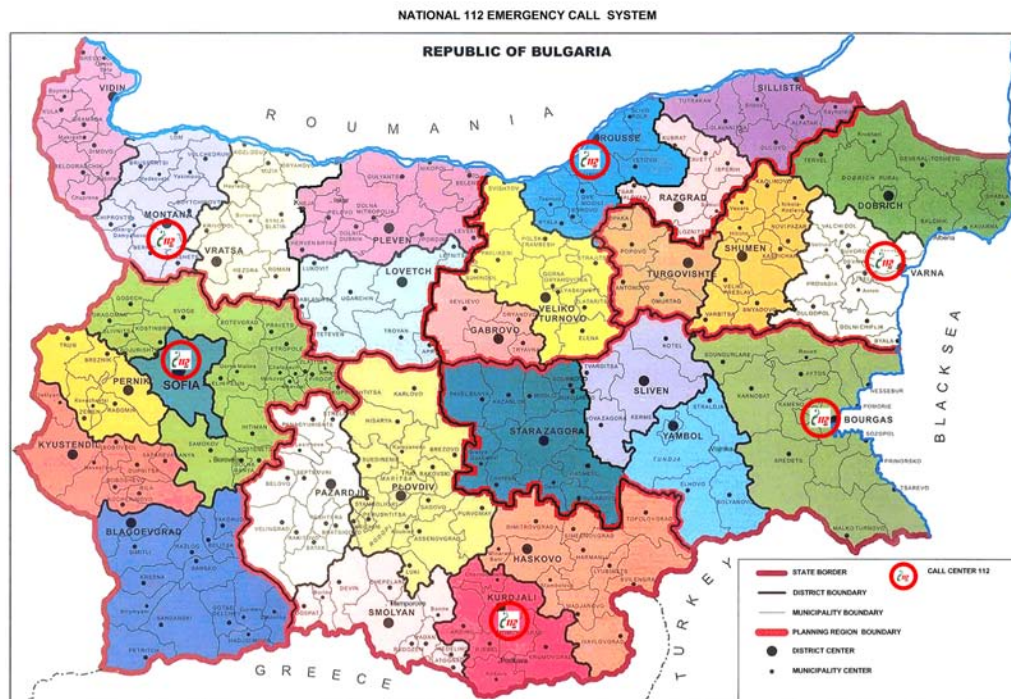
The institutions providing emergency services in Bulgaria are:

- Ministry of Emergency Situations: Civil protection service;
- Ministry of Health: Medical emergency service;
- Ministry of Interior: Police; Fire Brigade service;
- Bulgarian Red Cross: Mountain rescue service;
- Ministry of Transport: Marine Administration: Marine rescue service.

Currently each of the three main emergency services in Bulgaria – Police, Fire Brigade and Ambulance – has a specific call number. With the introduction of the 112 system the national numbers will be still operational for a period of one year. Subsequently calls will be routed to the 112 centres.

Figure F

Map of 112 call centres in Bulgaria.



The Ministry of Emergency Situations is responsible for the maintenance of the National Early Warning and Notification System. The existing system is currently being modernized up to European standards and by June 2009 will be fully operational both for the general population and for the institutions comprising the Integrated Rescue System.

The response units of the MES are the rescue teams. Each is geared with up-to-date special appliances and equipment for emergency rescue operations. For the professional development of the rescuers a Center for Professional Training of Rescuers, in Montana, was established. The MES rescue teams are supported by voluntary formations, established at municipal level.

In case of a disaster demanding coordination at national level, a Coordination Staff is set up. The Coordination Staff has the following major tasks:

- Analysis of the information on the disaster.
- Coordination of the activities of the executive power for mitigation of the disaster.

- Providing information to the population and the media on the disaster, the progress of the disaster mitigation measures and on the necessary protection means and activities of the population.

Municipality mayors can declare by order a 'state of disaster' with regard to the entire municipal territory, or a part thereof.

Regional governors can declare by order a state of disaster with regard to the entire territory of the region, or a part thereof:

- if it is necessary for activation of the regional disaster protection plan;
- upon a motivated request by mayors of municipalities from the region a state of emergency in the whole country (Level 1), or in a relevant part of it, is declared by a decision of the Council of the Ministers at the suggestion of the Minister of Emergency Situations.

An Interagency Relief and Recovery Committee functions within the Council of Ministers, headed by the Minister of

Emergency Situations. The Committee adopts decisions for disbursement of dedicated funds from the national budget, earmarked for preventing, bringing under control and overcoming the impact of disasters, and controls their purposeful spending.

Bulgaria is highly vulnerable to a variety of natural hazards, including floods, earthquakes and landslides. Forest fires are an emerging risk related to climate change. The following contains a brief overview of disaster risk reduction activities for each type of natural hazard.

The country is situated in a semi-arid zone and is influenced by both continental and Mediterranean climates. Floods are generated on Bulgarian territory under the following conditions:

- intensive snowmelt mixed with rainfall during the spring season (this is usually the case in some Bulgarian tributaries of the Danube, such as the Yantra and the plain regions in Northeast Bulgaria);
- flash floods caused by relatively isolated heavy rainfall during the summer season (this happens often in some river basins in South and Southeast Bulgaria such as the tributaries of the Arda, Maritza and Veleka rivers, as well as in some Danube tributaries such as the Yantra and Rusenski Lom);
- high flows with long durations which might affect the stability of levees and subsequent flooding (this is an issue only along the Danube).

Flood protection practices in Bulgaria comprise a range of activities of varying intensity, dependent on the level of flood risk. Various institutions and NGOs are involved in both short-term measures, such as flood forecasting and mitigation, and long-term measures, such as prevention, legislation and infrastructure development.

The institutions responsible for water management in Bulgaria are the Ministry of Environment and Waters (MOEW) and, to a certain degree, the Ministry of Regional Development and Public Works (MRDPW).

Flood protection is operational and permanent. The permanent protection is under the competence of the MOEW. The operational protection in case of a flood and flood mitigation activities are implemented by the National Civil Protection Service Directorate General of the MES and its territorial units. However, in case of catastrophic floods, the forces of the Integrated Rescue

System, as well as other resources, are involved in the process and are coordinated by the Regional Operational Communication Information Centres of the MES.

Long-term measures include planning development activities, training and exercises, and the evaluation of short-term measures adopted during flood periods. These activities are mainly dealt with by the MES and local municipalities.

Most of the river cross-sections are monitored through foot-gauges by observers who report water levels via telephone or telegraph. From the existing 210 river-level measuring stations, 44 are reporting at real- or semi-real-time. Daily data collection is arranged for 12 of those 44 stations, while for the rest a weekly cycle of daily values for the past week is arranged.

The National Institute of Meteorology and Hydrology (NIMH) is involved largely with short-term measures, including the forecasting and monitoring of floods and the issuing of alerts and warnings. As the national hydrometeorological service, NIMH has framework agreements for real-time data and flood forecasts/warnings exchange with the following relevant organisations:

- Greece: the PHARE and INTERREG II flood forecasting/warning systems are maintained for the Struma river basin under a cooperation agreement between the Bulgarian Ministry of Regional Development and Public Works and the Greek Ministry of Economy.
- Turkey: a framework agreement between NIMH and the State Hydraulic Works was adopted for data exchange and flood forecasting/warnings for the river Maritza. Project applications for further developments in the framework of NATO programmes are being developed.
- Romania: under the umbrella of the World Meteorological Organisation, an agreement was signed in October 2001 for real-time and flood forecasts/warnings exchange. The stations and the frequency of data which Bulgaria receives from Romania are given in Table 3.8.

The operational issue of reports and forecasts is made by the Hydrological Forecasting Division, which is part of the Hydrology Department of NIMH. Forecasts are based on operational observations of river levels and provisional ratings for real-time translations of levels into discharges; operational synoptic meteorological forecasts

of precipitation and air temperature; and operational forecasts of precipitation and air temperature coming from the High Resolution Limited Area meteorological forecasting model (ALADIN).

Most of the data processing work and calculations needed to issue the forecasts are computerized with relevant user interface and graphical visualization of the results. The evaluation of the forecasts and the issue of flood warnings are made by qualified hydraulic engineers.

The following enhancements would further improve accuracy and increase lead time of NIMH forecasts:

- Sophisticated snowmelt/rainfall-runoff and routing models (offering the opportunity to study in detail the spatial variability of runoff formation factors in the Bulgarian mountain landscape).
- Precise cross-section information and data generator DTM (to facilitate the calculation of flood risk at any lowland location of the river; determine danger levels at sensitive locations and predict areas at risk of flooding and the expected water levels).
- Real-time automatic telemetric hydrometeorological stations and high-resolution satellite data (offering the opportunity for operational analysis of the temperature and precipitation fields).
- More accurate air temperature and precipitation forecasting by non-hydrostatic Limited Area High Resolution Meteorological models.

Within the context of this review, it is worth considering this summary of disaster risk reduction activities undertaken during the 2005 flood event.

At the end of May and beginning of June 2005 the Republic of Bulgaria experienced severe floods, following torrential rainfall, which caused infrastructural damage to roads and bridges as well as to agriculture. The overflowing rivers flooded fields and many buildings and around 30 municipalities suffered severe infrastructural damage, including bridge collapses and heavy damage to the railway network.

The main impact of the flooding was on infrastructure and agriculture, which accounted for the biggest losses and had repercussions for the general economy of the area. According to the Ministry of Emergency Situations about 80 per cent of Bulgarian territory was affected and the damage was estimated at €872 million. Roughly 3,500 houses, both public

and private, were either completely destroyed or partially damaged and residents had to be moved to temporary shelters, mostly in schools or with host families.

A state of emergency was declared in the affected areas and the Government established an Intersectoral Coordination Committee at central level, headed by a Minister without Portfolio<sup>106</sup>. Civil Protection regional units (*Level 2*) were mobilized and local networks activated. Regions and municipal coordination committees were headed by the respective mayors and involved all relevant municipal and regional institutions and sectors, including public health officials, who were assisted by the Bulgarian Red Cross Emergency Response teams at regional and municipal level. The municipalities which were unaffected placed their human and material resources at the disposal of the affected areas.

The Ministry of Health (MoH) responded promptly from the start of the flooding, through the Directorate of Defence and Mobilization Preparedness and the National Medical Coordination Centre, at central level, and its Regional Inspectorates for Public Health Protection (RIPHP) and Regional Health Centres, in coordination with other governmental bodies, and in particular the National Civil Protection Service Directorate and its regional (*Level 2*) branches, at regional level.

Immediate assessment and urgent rescue and search activities were conducted by the National Civil Protection Service Directorate together with the health authorities and other government and private stakeholders in the main affected areas.

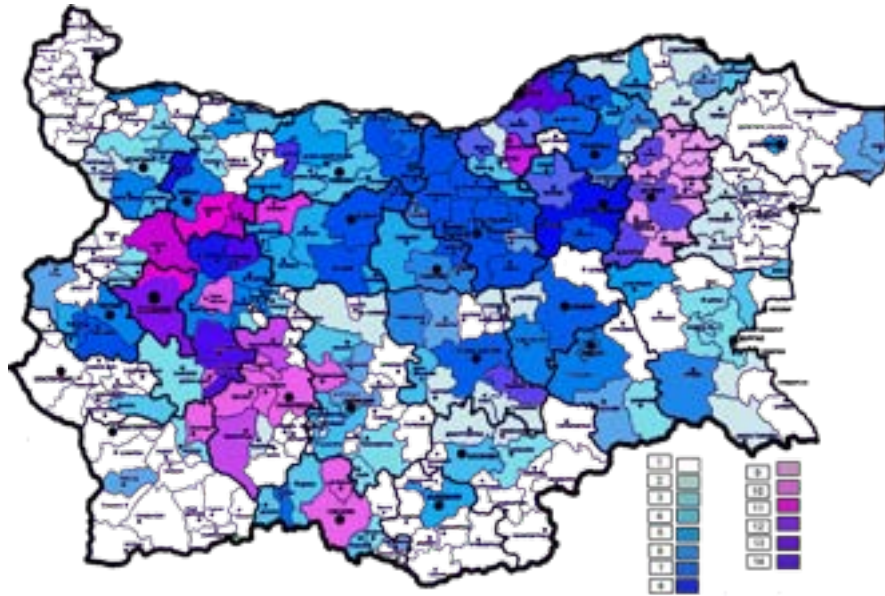
In terms of international response, the entire United Nations Country Team (UNCT) system, coordinated by the UN Resident Coordinator, was involved from the start to coordinate the humanitarian assistance response. Under the UN system, WHO took the responsibility to perform a rapid health assessment, focusing on environmental and public health aspects as possible consequences of the floods. The assessment was coordinated with the Directorate of Defence and Mobilization Preparedness, the Ministry of Health and the National Civil Protection Service Directorate. Bulgaria, situated in the Balkan region as a part of the Alpine-Himalayan seismic belt, is also exposed to a high

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<sup>106</sup> WHO/EURO Rapid Health Assessment of Flooding in Bulgaria, FINAL REPORT Sofia, 27 July 2005 visible at: [http://www.euro.who.int/document/EHA/RA\\_Bulrep.pdf](http://www.euro.who.int/document/EHA/RA_Bulrep.pdf)

Figure G

Map of the regions affected by the 2005 floods



seismic risk. Over the centuries, Bulgaria has experienced strong earthquakes. At the beginning of the last century (from 1901 to 1928) five earthquakes with Ms magnitude of 7.0 or over occurred there. The 1986 earthquake of Ms magnitude 5.7 that struck northern Bulgaria, near the town Strazhitza, is the strongest quake since 1928.

Moreover, the seismicity of the neighbouring areas, including Greece, Turkey, former Yugoslavia and Romania (especially the Vrancea intermediate-depth earthquakes), contribute to the seismic hazard in Bulgaria.

Recently, seismic hazard maps<sup>107</sup> for Bulgaria were presented at the International Symposium on Strong Vrancea Earthquakes and Risk Mitigation, held in October 2007, in Bucharest.

### 3.3.3 – Human resources and costs

According to the Disaster Protection Act activities related to the protection of the population and the national economy are funded through national and municipal budgets respectively, and also through self-generated

revenues, grants and relief aid.

Funds approved under the State Budget Act for prevention and mitigation of disasters caused by natural hazards or major industrial accidents are channelled into specific activities. The most important activities are:

- Rescue and emergency recovery.
- Construction of engineering facilities to remove risk and immediate danger to life.
- Constructive enforcement of building and equipment codes and regulations. This includes both State and municipal property and property damaged by disasters, accidents or other emergencies and certified as potentially dangerous, or with already-imposed usage restrictions or bans.

### 3.3.4 Civil Protection and society

The Ministry of Emergency Situations is currently pursuing an active policy in the field of training and education towards risk awareness.

<sup>107</sup> Maps of macro seismic intensities are in agreement with EC8. Simeonova et al., 2006.

Table 3.8: Risk exposure and organisation in Bulgaria.

<b>NATURAL HAZARDS</b>	<b>floods, flash floods</b>	<b>earthquakes</b>
level dealing with event	Level 1	Level 1
degree of impact	high	high
<b>preparedness</b>		
prediction system	yes	not applicable
vulnerability maps	yes	existing
<b>alerts and warnings</b>		
procedures	working at level 1 and level 2	not applicable
efficiency	medium	not applicable
public perception	medium	not applicable
<b>response and search and rescue</b>		
procedures	working from Level 1 to Level 2	working at Level 1
efficiency	medium	medium
public perception	medium	medium

The National Training Centre, the key Bulgarian institution dealing with disaster risk reduction training, is an administrative unit of the Ministry and its functioning and structure are regulated by the Disaster Protection Law.

The Disaster Protection Act ensures the training and education for central- and local-level executive authorities, response teams and the population. The MES, together with the Ministry of Education and Sciences, has taken measures to facilitate better training in the field of Civil Protection at all levels of the national education system, with a major focus on secondary and higher schools.

The National Training Centre also provides contemporary, interactive training for school teachers to enable them to take the disaster risk reduction message directly into classrooms. Under the ‘Prevention of natural disasters and accidents through the secondary education system in Bulgaria’ project, financed by UNDP, a special methodology was designed to introduce effective and modern approaches in disaster risk reduction education. The methodology includes three handbooks for teachers – from primary to high school level. Each

handbook covers the topics stipulated in the respective curriculum as per the Instruction of the Ministry of Education and Sciences of 2002. The topics are structured in three modules: disaster protection, fire safety and first aid.

To facilitate the disaster protection education of children and adolescents, a number of printed materials were developed and are regularly distributed in schools at the beginning of the school year. In addition, an interactive web tool was created – The Alphabet of Survival – which can be found on the MES website.

The MES is developing a new cooperation model for universities with the following goals:

- Planned and organised inclusion of scientific research potential for the development of disaster management.
- Development of a contemporary, specialist training system for the units of the MES.
- Preparation of specialists to be included in ministerial structures.
- Inclusion of a general discipline, worth 10-15 credits, in disaster protection and first-aid training, to be included in curricula at the discretion of the Academic Council of universities.

Table 3.9: Human resources involved in Civil Protection in Bulgaria.

HUMAN RESOURCES				
Level 1				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	no information available	no information available	no information available	no information available
% of the national active population	-	-	-	-
Level 2				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	no information available	no information available	no information available	no information available
% of the national active population	-	-	-	-

Table 3.10: Average annual costs of the Civil Protection system in Bulgaria.

ANNUAL COSTS							
Level 1							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in "peace periods"	percentage cost of fire-fighter national Corps due to activities during 'emergency periods'	percentage cost of Forest Management Corps	cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	no information available	no information available	no information available	no information available	no information available	no information available	no information available
% of the national GDP	no information available	no information available	no information available	no information available	no information available	no information available	no information available
Level 2							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of fire-fighter national Corps due to activities during 'emergency periods'	percentage cost of Forest Management Corps	cost of equipment, technologies and emergency assets		
euros (millions)	no information available	no information available	no information available	no information available	no information available		
% of the national GDP	no information available	no information available	no information available	no information available	no information available		
research and development							
	investments for university departments, research agencies and/or organisations working for Civil Protection		maintenance for university departments, research agencies and/or organisations working for Civil Protection		public or private companies supplying hardware and software		
euros (millions)	no information available		no information available		no information available		

- Setting up of inter-university centres as an opportunity for coordination of the national disaster protection programmes and activities on a European level.

In terms of cross-border activities, the MES is engaged in active and multifarious international cooperation aligned with the strategic goals of the Government. Activities are being carried out in compliance with national laws and ratified international contracts. Basic lines of cooperation are connected with Bulgaria's membership of NATO and the EU. Interactions with the UN, the European Council as well as other international organisations are being strengthened and contacts with South Eastern Europe and the Black Sea region, as well as bilateral cooperation, are becoming more intense.

Major directions for international cooperation include:

- Active participation in the Community Civil Protection Mechanism since 2003.
- Participation in the activities of all EU structures dealing with Civil Protection (PROCIV, CPC etc.).
- Active participation in the activities of the Senior Civil Emergency Planning Committee (SCEPC) and its planning boards and committees.
- Participation in the Euro-Atlantic Disaster Response Coordination Centre (EADRCC).
- Cooperation with UNDP on projects for training, supply of equipment etc.
- Coordination with OCHA and UNISDR.
- Participation in the European and Mediterranean Major Hazards Agreement (EUR-OPA) of the Council of Europe.
- Participation in the Disaster Prevention and Preparedness Initiative (DPPI) for South-Eastern Europe, CMEP for Southeast Europe, SEDM, the Black Sea Initiative and Black Sea Economic Cooperation etc.
- Membership of the group of experts on warning and detection systems (GOEWDS).
- Active bilateral cooperation.

Significant international activities include:

- Hosting of a number of international events and exercises:
  - EU TACOM – SEE 2006, SEESIM 08.
  - SEECF First Ministerial meeting of disaster preparedness and prevention for SEE.
  - Sixteenth Regional Meeting of DPPI.
- Participation in the exercises EU-HUROMEX 2008, ALBIS 2008, UUSIMAA 2008, and the EUROMED BRIDGE PROGRAMME etc.
- Organisation of the international exhibition for children 'Mission Rescuer 2008'.
- Participation in the nineteenth Crans Montana Forum and the Eurasia Forum.
- Negotiations on bilateral agreements with a number of countries, e.g. Macedonia, Croatia, Ukraine, Azerbaijan, Moldova and others.



## 3.4 Croatia

### *Public perception of Civil Protection*

Civil Protection is perceived in Croatia in terms of a system of 'protection and rescue' and it is the legal responsibility of the Government to ensure its proper functioning and management.

The new Law of Protection and Rescue states that citizens are required to implement measures of personal and mutual protection against threats and the consequences of disasters, based on the principle of solidarity and mutual help. Moreover, each citizen has the right and obligation to be trained in protection and rescue and has the right to receive full and timely information about all threats of disasters, as well as possibilities, measures and activities for protection.

It should be noted that there is a great tradition in Croatia of volunteering for forest fire-fighting duties. An estimated 60,000 people volunteer for these duties, representing over 2 per cent of the active population, mostly concentrated in inland areas of the country. Forest fires are the biggest perceived natural hazard.

### *Demography and administration*

Croatia has a population of almost 4.5 million people, giving it an order of magnitude of *Level 1* according to the classification used in this review<sup>108</sup>.

The country is divided into 20 counties (županija), plus the city district of Zagreb, the capital. Although the size of the counties varies greatly, and Zagreb alone has over 1 million inhabitants, for the purposes of this review all such administrative units will be classified as *Level 2*.

According to the Croatian constitution<sup>109</sup>, and on the basis of the principle of subsidiarity, municipalities and towns have responsibilities for fire-fighting and Civil Protection through a system of locally-based public

fire brigades and volunteer fire brigades<sup>110</sup>. Towns and municipalities have an order of magnitude of *Level 3*.

### 3.4.1 Legislation

Before the adoption in 2005 of the law<sup>111</sup> addressing protection and rescue activities the work of the Civil Protection services in the Republic of Croatia were controlled by a number of separate laws and regulations. The controls established the basic goals and objectives, the area of intervention, the methodology and the contents of plans relating to protection and rescue, and operational regulations for organising Civil Protection<sup>112</sup>. These laws and regulations were largely superseded by the Law of Rescue and Protection, which was promulgated in 2004 and came into force in 2005. It regulates:

- the system of protection and rescue of citizens, goods and property in disasters and major accidents;
- the management and coordination of protection and rescue activities;
- the rights, obligations, specific training and general education of participants in protection and rescue activities;
- the tasks and the structure of protection and rescue authorities; how to alert and warn, and how to organise mobilisation for the purposes of protection and rescue.

The act introduces three levels of Civil Protection organisation: central level (*Level 1*), which is primarily responsible for coordinating forces and is represented by the National Protection and Rescue Directorate; county level (*Level 2*), which is the responsibility of county prefects; and town or municipality level (*Level 3*), which is the responsibility of the town or municipality mayors.

In common with other countries of South Eastern Europe, a terminology commonly used at United Nations level is adopted into the Protection and Rescue Act.

The Law was updated in 2007, according to the SEVESO II Directive. Plans had been in place to adopt the Civil Protection Act before the end of 2006,

108 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

109 Croatian Official Gazette no.: 56, 22.12.1990.

110 European Commission. Screening report Croatia, Chapter 27 – Environment, 1 February 2007.

111 Protection and Rescue Act, Croatian Parliament at its session on 26 November 2004. No.: 01-081-04-3670/2.

112 International Civil Defence Directorate – Croatia. Available on-line at <http://www.icdo.org/act-coop-directory.html>.

along with changes to the Fire Fighting Act<sup>113</sup>, although according to recent information<sup>114</sup> adoption of both acts was due to be postponed until after the adoption of the Crisis Management Act.

The National Protection and Rescue Directorate coordinates a protection and rescue system that includes legal representatives, executive and representative bodies of local and regional self-government, governmental bodies such as the National Meteorological and Hydrological Service, and protection and rescue operational forces. It should be noted that, should any of the actors involved in Civil Protection fail in respect of their defined duties, penalties are only pecuniary.

The basic tasks and objectives of the Directorate are defined in the Protection and Rescue Act. Its operations are also governed by the Decree on the Internal Organisation of the National Protection and Rescue Directorate<sup>115</sup>. The Directorate is an independent governmental agency established by merging the Civil Protection sector and the Fire Brigade, and is responsible for disaster management and disaster risk reduction in Croatia.

The National Protection and Rescue Directorate is a professional and administrative organisation with the task of preparing plans and managing operational forces as well as co-coordinating the activities of all participants in the protection and rescue system. According to protection and rescue legislation, the basic tasks of the Directorate are risk and vulnerability assessment, drafting measures aimed at preventing crises and accidents, ensuring that these measures are implemented, and effective emergency management in case of major disasters. These objectives, which are partially superimposed on to the general objectives defined by law, are pursued and realised through:

- monitoring and assessing activities throughout the outbreak and the development of a disaster or major accident;

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113 Croatian Official Gazette no.: 106, Fire Brigade Act, October 15, 1999.

114 European Commission. Screening report Croatia Chapter 27 – Environment, 1 February 2007. Croatia is periodically subject to screening by the European Commission with reference to the EU accession process: its progresses in order to adapt its institutional and economic structure to the required standards are monitored and periodically reported to the European Parliament and the Council.

115 Decree on the Internal Organization of the National Protection and Rescue Directorate, 8 February 2005.

- increasing and improving the preparedness of the existing operational and institutional forces in terms of response to disasters and major accidents;
- continuous organising, preparing, training of participants in protection and rescue;
- alerting citizens and issuing guidance on protection and risk reduction measures;
- maintaining awareness among participants in protection and rescue activities of hazards, as well as of protection and rescue measures and activities;
- activating operational forces;
- performing protection and rescue tasks in cooperation with competent bodies of other States and international organisations, based on international agreements.

### 3.4.2 Civil Protection structure

Each of the three different levels of Croatian Civil Protection has its own distinct role and mandate.

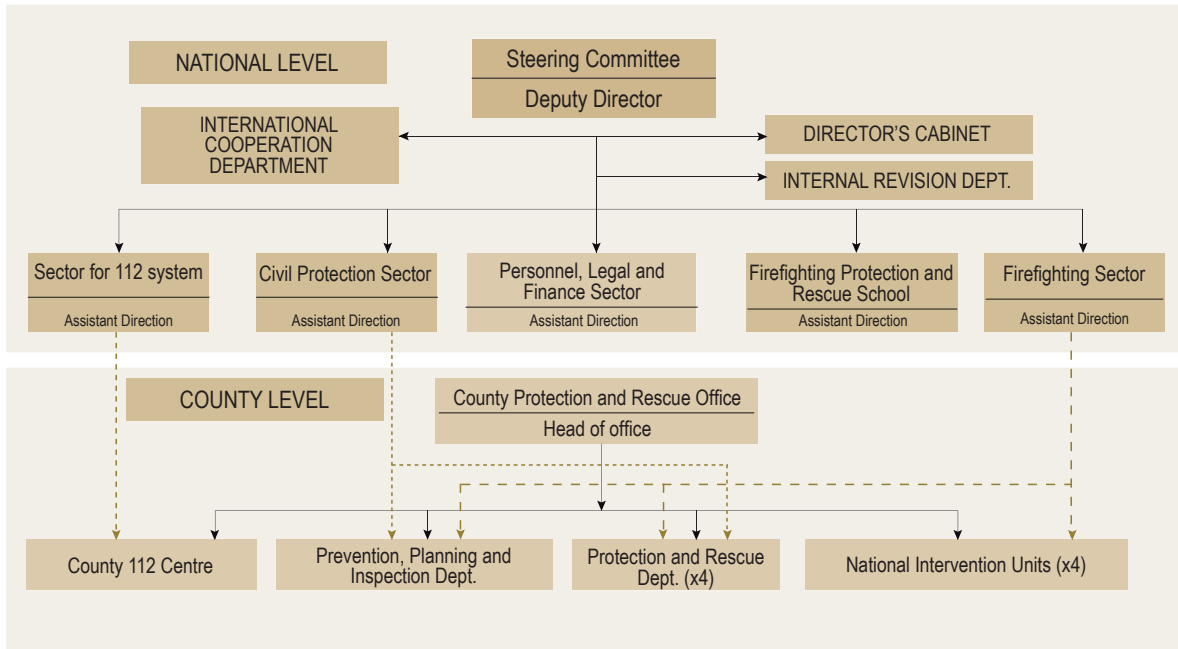
In the event of a major accident or disaster in the territory of a municipality or town the immediate responsibility for mobilizing a Civil Protection response lies with the relevant *Level 3* authority. The authority has the right and the duty to mobilize all available human and material resources to deal with the event according to the protection and rescue plan. When all relevant capacities and capabilities in the administrative area have been employed the *Level 3* authority can request further assistance from county level (*Level 2*) by contacting its prefect.

This process is repeated at county level. In the event of a major accident or disaster in the county the immediate responsibility for mobilizing a Civil Protection response lies with the county prefect. The county authority has the right and the duty to mobilize all available human and material resources to deal with the event according to the protection and rescue plan. When all relevant capacities and capabilities in the county have been employed the *Level 2* authority can request further assistance from central level (*Level 1*) by contacting the National Protection and Rescue Directorate.

It is important to remember that under the present system the Directorate includes its regional offices, located in each of the 20 counties and the city district of Zagreb, along with its central body. This structure will continue

Figure 3.13

Structure The structure of the National Protection and Rescue Directorate command and control chain at Level 1 and Level 2<sup>116</sup>.



until the process of decentralization is complete, at which time the regional offices will be assigned to regional administrations.

It is worth noting that although the Directorate is an independent organisation it is represented in the Government by the Ministry of Interior. The organisation is divided into the following five sectors: the Sector for the 112 Emergency European Number; the Civil Protection Sector; the Fire-fighting Sector; the Fire-fighting Protection and Rescue School; and the Personnel, Legal and Finance Sector. The creation of the Directorate was clearly an attempt to unify into a unique coordinating body several units that were already operational.

The Directorate's regional offices, namely the County Protection and Rescue Offices, each includes a county 112 centre and a Prevention, Planning and Supervision Department linked to the Civil Protection Sector and the Fire-fighting Sector at *Level 1*. Moreover, four National Intervention Units in Split, Zadar, Šibenik and Dubrovnik, linked to the Fire-fighting Sector, as well as four Protection

and Rescue Departments with response capacities, linked to the Civil Protection Sector, can operate at *Level 2*.

There are 720 people employed permanently at the National Protection and Rescue Directorate, 180 of them staff offices at *Level 2*. Figure 3.13 provides a graphic representation of the Directorate command and control chain at *Level 1* and at *Level 2*.

To better understand the organisation of the Directorate it is necessary to analyse in more detail the sectors that compose it.

- The Sector for the 112 Emergency European Number is responsible for the information flow to all the actors involved in Civil Protection regarding all possible threats and their consequences. The service, which also benefits from the information of Government institutions addressing issues linked to natural and technological hazards, such as that provided by the Meteorological and Hydrological Institute of Croatia, keeps logs on the unfolding emergency events. Incoming reports are usually vocal or textual, such as bulletins from a Government

116 Courtesy of the Croatian National Protection and Rescue Directorate.

agency. Warnings are communicated to the public by means of sirens. The 112 system has a central unit at *Level 1*, plus 20 regional units at *Level 2*. More than 300 people are involved in the whole system, mainly at *Level 2*, and they constitute the largest single group of employees at the Directorate, although their number has been reduced significantly over the past three years in a rationalisation process that has closed all *Level 3* units, which were considered too marginal.

- The Civil Protection Sector was created in 1926 and is involved in the management of all Civil Protection forces during major accidents and disasters, conducting mobilisation and coordination of operational protection and rescue forces. During emergencies it is responsible for organising the headquarters at the appropriate level to deal with the event: be it municipality at *Level 3*, county at *Level 2*, or Directorate at *Level 1*. In the latter case, the headquarters respond to the head of the Directorate, and the head of the Directorate in turn responds directly to the Prime Minister. In addition to regular employees, the Civil Protection System can call on 900 specialist technicians in case of emergencies, called into service through the police system. The Civil Protection Sector also develops response plans and conducts risk assessments and prevention activities, in line with strategic and operational plans.
- The Fire-fighting Sector is the oldest of the Directorate sectors and was established more than 140 years ago. Prior to 1991 it was organised only at local level, but was initially centralized under the Ministry of Interior following independence, before being re-structured once again to return to *Level 3* authorities the right and the duty to manage fire brigade units. Currently, 50 professional fire-fighters are employed at *Level 1*, with more than 2,300 professionals employed in the 21 *Level 2* and 550 *Level 3* fire brigade units. It should be noted that only 62 municipalities employ professional fire-fighters, with the remainder relying on volunteers. Although under the terms of the Constitution of Croatia management of the fire brigades is the responsibility of *Level 3* authorities the central authority can intervene and make use of local forces in emergencies, even moving units from one area to another. Moreover, local authorities are only partly

responsible for the financing of fire brigade units, with a proportion of the approximately €40 million annual cost of the service (84 per cent of which is spent on salaries) coming from the Minister of Finance.

- The Fire-fighting Protection and Rescue School is responsible for education and training in the field of fire-fighting, protection and rescue and for developing curricula. It prepares, conducts and monitors the schooling, training and advanced training of professional fire-fighters, on the basis of two different training programmes: an eight-month programme for fire-fighters and a one-year programme for technician fire-fighters. The school is also responsible for the education of pre-school-age children and conducts courses for civil servants and employees of local administrations in the field of protection and rescue.

In terms of exposure to natural hazards, Croatia suffered floods, transport accidents, extreme temperatures, wildfires, wind storms, earthquakes and droughts as per EM-DAT<sup>117</sup> during the period 1989–2006<sup>118</sup>. Among them, the National Protection and Rescue Directorate considers the hazards represented by wildfires, floods and earthquakes as most significant.

The Civil Protection Sector is recognised by the Directorate as having competences for the management of flood and earthquake events, while the Fire-fighting Sector has competences for the management of wildfires. In addition, the Directorate recognises the competences of the Ministry of Agriculture, Forestry and Water Management for managing protection from the adverse effects of water, ice, erosion and flooding. Croatian Water, a State agency responsible for water management, deals also with the organisation of protection from floods and ice, and with the protection from erosion<sup>119,120</sup>.

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117 Emergency events database, created and maintained by the WHO Collaborating Centre for Research on the Epidemiology of Disasters (CREED).

118 WORLD BANK, SEEDRMI, Desk Study Review Risk Assessment in South Eastern Europe, final report, July 2007.

119 Republic of Croatia, Environmental Operational Programme 2007-2009. Instrument for Pre-Accession Assistance. 2007HR16IPO003.

120 It seems that there is some conflict between the different agencies.

Table 3.11: Risk exposure and organisation in Croatia.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	tornadoes	earthquakes
level dealing with event	Level 1 <sup>(A)</sup>	Level 2 <sup>(B)</sup>	Level 1	Level 2	Level 1 <sup>(C)</sup>
degree of impact	high	high	high	low	high
<b>preparedness</b>					
prediction system	working at Level 1 <sup>(D)</sup>	not applicable	working at Level 1 <sup>(D)</sup>	no	not applicable
vulnerability maps	existing <sup>(E)</sup>	existing in a few Level 2 or Level 3 areas <sup>(B)</sup>	no available information	no available information	no available information
<b>alerts and warnings</b>					
procedures	working at Level 1	not applicable	working from Level 1 to Level 3	no	not applicable
efficiency	low		upper-medium		not applicable
public perception	low	not applicable	upper-medium	no information available	not applicable
<b>response and search and rescue</b>					
procedures	working at Level 1 and Level 2	no available information	working from Level 1 to Level 3	no available information	not available information
efficiency	no data	no data	upper-medium	no data	no data
public perception	no data	no data	upper-medium	no data	no data

Notes to Table 3.11:

- (A) According to the Environmental Operational Programme 2007-2009 (the document drawn by the Republic of Croatia in connection to the Instruments for Pre-Accession Assistance) the country is subject to considerable periodic flooding, which inflicts severe economic damage.
- (B) The Rječina River Valley is an example of an area in which researchers and scientists in the field of landslide hazard assessment have specifically focused on. Several papers were proposed on this topic; among them, Benac et al. 2005, 'Qualitative Assessment of Geohazard in Rječina Valley, Croatia', Geophysical Research Abstracts, Vol. 7, 08943, 2005.
- (C) South Eastern Europe Disaster Risk Management Initiative. Desk Study Review Risk Assessment in South Eastern Europe, final report.
- (D) This activity is external to NPRD and is organised by the Meteorological and Hydrological Institute of Croatia.
- (E) The International Sava River Basin coordinates the activities for the preparation of the Sava River Basin Management Plan.

Along with disaster prevention and mitigation, early warning, and preparedness and response the National Protection and Rescue Directorate is responsible for analysing the threat assessments covering the entire national territory and developing the Protection and Rescue Plan of the Republic of Croatia. For these activities the Directorate can avail itself of governmental services including those of the fire brigade, meteorological and hydrological service, seismological service, and sea rescue service. According to article 24 of the Protection and Rescue Law these services have a duty to inform the Directorate when, within the scope of their competences, they identify a risk of disaster or major accident. Moreover, they can be ordered to supply their expertise in connection with specific topics.

The system of alerting authorities is based entirely on the emergency number 112. Through this system, reports and signals regarding all levels of emergencies are collected and alerts are issued. The new system of 112 operational units is based on the conversion of a pre-existing system, under which almost every town in Croatia had an emergency number unit. Under the new system the number of units was reduced and the capacities of those that remained were significantly improved, mainly through technological advances. The aim is to transform the 112 system into a unified structure for information sharing so that it can become a fundamental tool for the coordination of the various forces.

Despite the introduction of the new 112 system, the actual communication of alerts is through a rather antiquated

means of sirens warning the public of imminent threats. The system uses a series of tones or particular sounds, with each corresponding to a distinct threat and requiring prescribed action by the public. The over-1,500 sirens are distributed throughout the country, but much of the technology used is obsolete and maintenance and rent costs for transmission networks are very high.

The Meteorological and Hydrological Institute of Croatia, founded in 1947 during the period of former Yugoslavian Federal Republic, is one of the agencies linked to the 112 network. It can use the system to disseminate information and issue alerts, and provides expert support to agencies from *Levels 3 to 1*. The Institute provides services including bespoke internet pages showing forest-fire indexes for fire brigades operating at *Level 3*. Textual warnings are prepared for the National Protection and Rescue Directorate, as for other interested actors, with references to severe weather events<sup>121</sup>. Moreover, the Institute maintains archives of historical hazard data, which includes standardized hydrometeorological information, although it does not include information on loss of life or economic costs.

The procedure and the available tools for the management of different natural hazards are briefly revised in Table 3.12.

The structures to recognize and deal with the risks posed by technological hazards are not as well defined as they are for natural hazards. However, the recent adoption of the Seveso II EU Directive has increased awareness of the risks associated with industrial accidents, as well as the need to organise and equip operational units to face this kind of threat. The presence of nuclear facilities close to Croatian territory, even though the country does not base its electricity production on nuclear power, is a hazard that the Civil Protection sector is aware of.

Moreover, the threats linked to war are perceived as significant at *Level 1*, with special attention given to the problems connected to refugees.

### 3.4.3 Human resources and costs

Table 3.12 and Table 3.13 report the resources, both human and financial, assigned to the Civil Protection

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121 BENG TAMMELIN, Country Profile: Croatia – For the UN/ISDR Project 'Strengthening of Hydrometeorological Services in South Eastern Europe', 2007.

structure at different levels. Please note that for *Level 2* and *Level 3* there is no account of the potential involvement of private contractors.

In terms of human resources, there are a total of 540 people ordinarily employed in Civil Protection duties at *Level 1*; all are public servants employed with the National Protection and Rescue Directorate, including staff of the 112 system. This number can expand during emergency periods with the addition of up to 900 private specialist contractors and 50 professional firemen.

At *Level 2*, 180 people participate in Civil Protection in times of peace, mainly employees of the 112 system at county level.

At *Level 3*, over 62,000 people can be involved in Civil Protection in times of emergency, of whom 2,300 are professional fire-fighters and 60,000 are volunteer fire-fighters. Please note that for *Level 2* and *Level 3* there is no account of the potential involvement of private contractors.

It should be noted that some of the data in Table 3.13 is the result of an extrapolation of available information on the total cost of the Fire-fighting Sector, including the annual cost of salaries for professional fire-fighters, which currently stands at €33.6 million. On the basis of this figure, it was calculated that the overall annual cost of Civil Protection at *Level 1* is equal to €8.3 million, of which €7.5 million is for the salaries of public servants involved in Civil Protection during peace periods, €0.7 million is for the salaries of professional fire-fighters, and €0.1 million is for equipment, technologies and emergency assets. Total annual costs at *Level 1* are the equivalent of 0.017 per cent of total GDP.

The overall cost of Civil Protection at *Level 2* and *Level 3* is estimated at €41.7 million, of which €2.5 million is for the salaries of public servants involved in Civil Protection during peace periods, €33 million is for the salaries of professional fire-fighters, and €6.2 million is the cost of equipment and emergency assets for the fire-fighting sector. The total yearly costs at *Level 2* and *Level 3* are equal to 0.081 per cent of GDP.

### 3.4.4 Civil Protection and society

Training and education in the field of Civil Protection are managed and organised mainly by the Fire-fighting Protection and Rescue School of the National Protection and Rescue Directorate. Education programmes are addressed to pre-school children,

Table 3.12: Human resources involved in Civil Protection in Croatia.

HUMAN RESOURCES				
Level 1				
	people involved in CP in 'peace periods'	public servants in 'peace periods'	private contractors in 'peace periods'	people involved in CP in 'emergency periods'
quantity	540 <sup>(A)</sup>	540 <sup>(A)</sup>		540 + 900 <sup>(B)</sup> + 50 <sup>(C)</sup>
% of the national active population	0.018	0.018	no information available	0.05
Level 2				
	people involved in CP in 'peace periods'	public servants in 'peace periods'	private contractors in 'peace periods'	people involved in CP in 'emergency periods'
quantity	180 <sup>(A)</sup>	180 <sup>(A)</sup>		180 <sup>(A)</sup>
% of the national active population	0.006	0.006	no information available	0.006
Level 3				
	people involved in CP in 'peace periods'	public servants in 'peace periods'	private contractors in 'peace periods'	people involved in CP in 'emergency periods'
quantity				2,300 <sup>(C)</sup> + 60,000 <sup>(D)</sup>
% of the national active population	no information available	no information available	no information available	~2.09

Notes to Table 3.12:

- (A) National Protection and Rescue Directorate, including the sector for the 112 system.
- (B) Private specialist contractors.
- (C) Professional fire-fighters. They are assigned by the Constitution to local authorities, but the central Fire-fighting Sector can move them from their assigned location to another in case of necessity.
- (D) Volunteers. They are located mainly in the inland area, even though the majority of forest fires, especially in the summer season, are concentrated in the coastal area.

identifying risks and basic rules of behaviour. No education programmes currently exist for high-schools or universities.

As previously mentioned, this sector prepares, conducts and monitors the schooling, training and advanced training of professional fire-fighters, and it conducts courses for civil servants and employees in local administrations in the field of protection and rescue.

The school cooperates with several training institutions in the field of Civil Protection. Among them are the United Kingdom's Bournemouth University, which leads a series of short courses on international disaster management, and with FORMEZ, an Italian training centre linked to the Presidency of the Council of Ministers.

Moreover, Croatia has been active in the early days of the Stability Pact – DPPI, mainly by introducing its own training events in the Disaster Management Training Program (DMTP), initially developed by Croatia and Slovenia. The training projects should remain also in the newly established and regionally owned DPPI, a cooperative network for countries in South Eastern Europe, created in 2008, succeeding both the Stability Pact for South Eastern Europe and the Southeast European Cooperation Process.

The Meteorological and Hydrological Institute of Croatia is playing a key role in helping to build the capacities of the country's Civil Protection sector by pursuing several research and development initiatives. Since 2007 it has been inserted into the Network of European Meteorological Services (EUMETNET) and has participated in the training

Table 3.13: Average annual costs of the Civil Protection system in Croatia.

ANNUAL COSTS						
Level 1						
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'emergency periods'	cost of professional fire fighters at Level 1	cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	7.5	no available information	0.7	0.1 <sup>(A)</sup>	no available information	8.3 <sup>(C)</sup>
% of the national GDP (B)	0.015	no available information	0.0014	0.0002	no available information	0.017 <sup>(C)</sup>
Level 2 and Level 3						
	public servants involved in CP in 'peace periods'	cost of professional fire-fighters at Level 2 and Level 3	cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection	
euros (millions)	2.5	33	6.2 <sup>(A)(B)</sup>	no available information	41.7 <sup>(C)</sup>	
% of the national GDP (B)	0.0049	0.064	0.012	no available information	0.081 <sup>(C)</sup>	
research and development						
	investment for university departments, research agencies and/or organisations working for Civil Protection	maintenance for university departments, research agencies and/or organisations working for Civil Protection	public or private companies supplying hardware or software			
euros (millions)	no available information	no available information	no available information			

Notes to Table 3.13:

(A) Fire-fighting Sector.

(B) Financed partially by local authorities (1.3 per cent of the income taxes) and partially by the Ministry of Finance.

(C) Incomplete information.

project EUMeTrain, co-financed by the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), a body the institute also participates in. In addition, the Institute participates in the MEDiterranean Experiment (MEDEX), which is part of the WMO programme through its involvement in the Observing-system Research and Predictability Experiment (THORPEX), through the project 'Cyclones that produce high impact weather in the Mediterranean', and to the ECMWF, the European Centre for Medium-Range Weather Forecasts.

As well as its active involvement in international programmes and projects, the Institute provides expertise, added value and offers further potential for enhanced Civil Protection. Its role, and those of other governmental services and research institutes, could be further enhanced through clearer legal definition.

In terms of cross-border activities, the National Protection and Rescue Directorate actively pursues

international cooperation and has signed several bilateral cooperation agreements and joined several regional initiatives. The areas of interest of these cooperative activities include mutual notification, assistance, training, exchange of information regarding scientific achievements, cooperation in equipment development and standardisation, as well as interoperability of operating procedures.

With reference to bilateral cooperation, agreements have already been signed with the Republic of Hungary, Republic of Slovenia, Bosnia and Herzegovina, Republic of Slovakia, Republic of Poland, Republic of Austria, French Republic and Montenegro. Further agreements with the Russian Federation, Ukraine, Republic of Macedonia, Republic of Montenegro and Republic of Serbia are under negotiation.

The principal area of interest for Croatia is of course that of South East Europe. In this context, Croatia participates in the DPPI, in the CMPEP SEE (Civil-



Military Emergency Planning Council for South East Europe), in the SEDM – SEESIM (South Eastern Europe Defence Ministerial – South Eastern Europe Simulation) initiative, EUR-OPA, and in the Central European Initiative (Working Group for Civil Protection).

A Memorandum of Understanding between the EC and Croatia on the participation of the Republic in the Civil Protection Financial Instrument was signed in September 2007. Also, Croatia signed the Memorandum of Understanding for participation in the Community Civil Protection Mechanism, in December 2008.

Croatia is a potential candidate country of the EU and has been subject to several screenings on the progress made in preparation for, and in connection to, the opening of accession negotiations. A European Commission screening report<sup>122</sup> confirmed that a part of the Seveso II Directive (96/82/EC)<sup>123</sup> was implemented through the Environmental Protection Emergency Plan, thus fulfilling the EU requirements in this field.

In terms of the organisation of humanitarian aid, the 2007 Progress Report<sup>124</sup> states that although the Department for Humanitarian Aid and Cooperation with Civil Society Organisations has been established in the Ministry of Health and Social Welfare, and preparations in this area have started, it is not yet operational.

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122 European Commission. Screening report Croatia Chapter 27 – Environment, 1 February 2007.

123 COUNCIL DIRECTIVE 96/82/EC, 9 December 1996, on the control of major-accident hazards involving dangerous substances.

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124 Commission of the European Communities. Croatia 2007 Progress Report, accompanying the Communication from the Commission to the European Parliament and the Council. Enlargement Strategy and Main Challenges 2007-2008.

## 3.5 Former Yugoslav Republic of Macedonia

### *Public perception of Civil Protection*

In common with most South Eastern European countries, Civil Protection in the Former Yugoslav Republic of Macedonia<sup>125</sup> is still perceived in terms of a system of ‘protection and rescue’ and it is the legal responsibility of the Government to ensure its proper functioning and management.

The Law on Protection and Rescue determines the State’s legal responsibilities with regard to protection and rescue activities involving citizens, flora and fauna, common goods and items or facilities of special cultural and historic importance (determined by law as goods for general interest). The safeguarding of life and health is the statutory priority.

The Law on Crisis Management requires that ministries and other governmental institutions, public enterprises and services as well as private enterprises take part in prevention and crisis management as well as rescue and protection of people and goods. Furthermore, they are required to participate in training and drills in prevention and crisis management.

The concept that foreign citizens have the right to receive assistance in case of disasters is not clearly defined in Civil Protection law. Indeed, the only reference made by law to citizens of other countries is a statement that obliges foreigners who permanently reside in the territory of the FYR of Macedonia, foreign trade companies, individual businessmen and their branches to make available their assets.

### *Demography and administration*

The FYR of Macedonia has a population of almost 2 million people, giving it an order of magnitude of *Level 1* according to the classification used in this review<sup>126</sup>.

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125 The constitutional name of the country is Republic of Macedonia

126 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

The country is divided into eight regions, each with a regional crisis management centre headquarters and Civil Protection headquarters, plus the capital city municipality of Skopje, which has a population of around 500,000. Although the sizes of the regions vary they generally have an order of magnitude of *Level 2*.

The regional headquarters manage Territorial Protection and Rescue Forces, which include a range of Civil Protection services including fire-fighting units, medical units, protection and animal rescue units<sup>127</sup>, and units to coordinate the evacuation and sheltering of people at risk.

The regions are further subdivided into 32 municipalities (*Level 3*). The following actors are responsible for Civil Protection at this local level:

- Protection and rescue forces;
- TFF (professional fire-fighters);
- Private companies and public enterprises.

### 3.5.1 Legislation

Although a number of laws still in use in the FYR of Macedonia date from the Socialist period, their essence – irrespective of the possibly inappropriate terminology for various economic, political or even administrative arrangements – is technically correct and well structured. As such, it is still applied when necessary. At the same time, there is an ongoing process of harmonization of the legislation of the FYR of Macedonia with a new reality and this harmonization is referring, among other areas, to the Civil Protection sector.

The FYR of Macedonia’s Civil Protection system includes the following bodies and activities: State authorities; local self-government units; public institutions and organisations; private companies; protection and rescue services covering the population and property in the event of war, other military threats or military calamities, and disasters caused by natural hazards; mitigation of the consequences arising from these events; and preparedness and participation of civilians.

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127 The special attention to animals reflects the agricultural and pastoral origin of the country.

Figure 3.14 Administrative divisions of Macedonia (Level 2): eight regions<sup>128</sup>.



The civil emergency management function is regulated by two acts: the Law on Crisis Management<sup>129</sup> and the Law on Protection and Rescue<sup>130</sup>.

The Law on Crisis Management governs the response to emergencies in terms of organisation and functioning; decision-making and resource utilisation; communication, coordination and cooperation; planning and financing; and an assessment of the security risk to the FYR of Macedonia.

The different actors involved in the crisis management system include: State administrative bodies and authorities (the Assembly, President and Government), Armed Forces, protection and rescue forces, and bodies of municipalities and the city of Skopje. The law also states that public enterprises and institutions as well as private companies can take part in prevention, early warning and handling of crises.

In a crisis situation a Steering Committee and Assessment Group and a Crisis Management Centre are established at national level (*Level 1*), as described in Figure 3.15. The Steering Committee is composed of the Ministers for Interior, Health, Transport and Communications, Defence, Foreign Affairs and the Head of the Assessment Group. If necessary, depending on the crisis situation, other heads of relevant State administrative bodies can also be included in the work of the Steering Committee.

The Assessment Group is a governmental body that performs constant assessment of the risks and dangers to the security of the FYR of Macedonia and proposes measures and activities for their prevention, early warning and management. The Group delivers its analyses, recommendations and conclusions to the Steering Committee, Prime Minister, President of the Republic and President of the Assembly.

128 Courtesy of the Crisis Management Centre

129 Official Gazette of RM, No. 29/2005.

130 Official Gazette of RM, No. 36/2004.

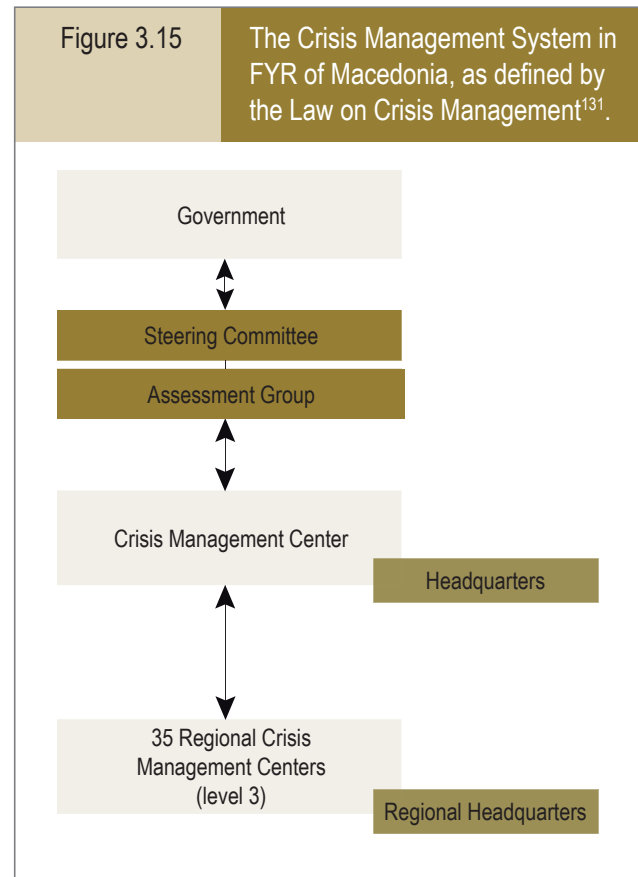
The Crisis Management Centre holds the strategic position within the Crisis Management System (CMS – *Level 2*). It is a governmental agency in charge of coordination of crisis management activities. This includes inter-departmental and international cooperation and consultations for the purpose of crisis management. Furthermore, the CMC is in charge of the preparing and updating of a unified assessment of the risks and threats to the security of the Republic, and the proposing of measures and activities to resolve the crisis situation. Also, the Centre has an operational role in the national CMS. Within the CMC, the General Headquarters is in charge of crisis management activities. The Centre has both strategic planning and operational functions.

The Crisis Management Centre established 35 regional crisis management centres (*Level 3*) in order to monitor situations, exchange information and data, make and prepare assessments, and inform and broadcast alerts to the population. The regional centres have regional headquarters. Finally, the regional crisis management centres are grouped into eight major CMS regions.

In the event of a major emergency a crisis situation can be declared if there is significant threat to the life or health of people or animals, or a danger to goods or the security of the Republic, or a part of it. The formal decision to declare a crisis situation is made by the Government, which also determines the specific area of intervention and activates the mechanisms for crisis solving. Once such a decision is adopted, the Government informs the Assembly and the President of the FYR of Macedonia.

Within this framework, the issue of timely information and early warning is the responsibility of the Crisis Management Centre, which must raise the alarm to alert the population in the event of an emergency situation.

To further this end, the CMC is establishing a cooperation network with a number of institutions and CMS stakeholders. In that regard, there is particularly close cooperation with the Republic Institute of Hydrometeorology, which holds a significant role in crisis management by providing data and information on early warnings related to flash-floods, extreme rainfall events and wildfires. However, strong investment is needed in order for the Institute to achieve its potential and



approach European levels of hydrometeorological and hydrological forecasting and data to facilitate effective management of disaster risk reduction.

The concept of Civil Protection in the FYR of Macedonia is strictly interpreted in terms of protection and rescue. Present legislation reflects this and represents an attempt to establish a legal framework to facilitate the efficient management and functioning of protection and rescue. Current legislation is aimed at providing several innovative solutions to Civil Protection needs in comparison to the previous, Socialist, legislative framework<sup>132</sup>.

In particular the Law on Protection and Rescue indicates how responsibilities are divided between the participants in protection and rescue activities, including the State, local authorities, private companies, and public enterprises, facilities and services. The law regulates the division of responsibilities in accord with the provisions in the Local Self-Government Law which devolve

131 Courtesy of FYR of Macedonia Ministry of Interior Affairs – Protection and Rescue Directorate.

132 Official Gazette of SRM No. 39/77, Law on Protection Against Elementary Disasters.

obligations of protection and rescue to municipalities. Protection and Rescue Units are organised into two components: active and reserve.

The law also determines in detail the responsibilities of the Protection and Rescue Directorate, as an independent State authority, in the conduct of protection and rescue activities. The Directorate has the task of coordinating the sectors of Civil Protection, currently incorporated in the Ministry of Defence, and of Fire Protection, currently within the Ministry of Interior.

State authorities have different responsibilities. The Republic's Parliament adopts the National Strategy plan for protection and rescue, determines strategic medium-term protection and rescue goals, decides on the amount of financial assets necessary for protection and rescue and proclaims a Protection and Rescue Day.

The Crisis Management Centre is in charge of administrative-expert support of the Government bodies (Steering Committee and Assessment Group) in the following activities:

- sending humanitarian protection and rescue aid to other countries and acceptance of humanitarian protection and rescue aid from other countries;
- sending abroad for training, exercise and humanitarian activities protection and rescue forces established by the Republic;
- deciding on the amount of damages paid to citizens following disasters caused by natural hazards, including epidemics, epizootics and others;
- deciding on population evacuation;
- determining simulation exercise activities for State authorities, local administrations, private companies, public enterprises, institutions and services.

The role of the Protection and Rescue Directorate, established by the Law on Protection and Rescue, will be discussed in the next section.

### 3.5.2 Civil Protection structure

The Civil Protection command chain operates on three different levels: *Level 1*, *Level 2* and *Level 3*.

At central level (*Level 1*) the Directorate establishes the main Headquarters to manage protection and rescue activities in the FYR of Macedonia; the Directorate

Director is commander of these Headquarters. Rapid Response Teams, established within the Directorate, are a pillar of the protection and rescue forces and specialize in various fields.

At regional level (*Level 2*) protection and rescue units are established within the Directorate. The regional head is the chief of the regional protection and rescue organisational unit. The regional headquarters are activated by a decision issued by the Directorate Director. Members of the regional headquarters are Directorate employees or experts from State authorities, public enterprises or institutions.

At municipal level (*Level 3*) councils of administrations have a duty to manage protection and rescue involving fire-fighting, local accidents, landslides, snowfall and avalanches. Mayors are responsible for proposing protection and rescue plans, the engagement of protection and rescue forces, and preparedness. If the scale of the emergency exceeds the capacities of the local administration to cope, it can engage the forces of the Republic.

Below municipal level the range of protection and rescue actors includes professional fire-fighters TFF, private companies and public enterprises.

Figure 3.16 charts the functions and organisation of the Civil Protection structure.

Figure 3.16 Command and control chart of the FYR of Macedonia Civil Protection structure<sup>133</sup>.

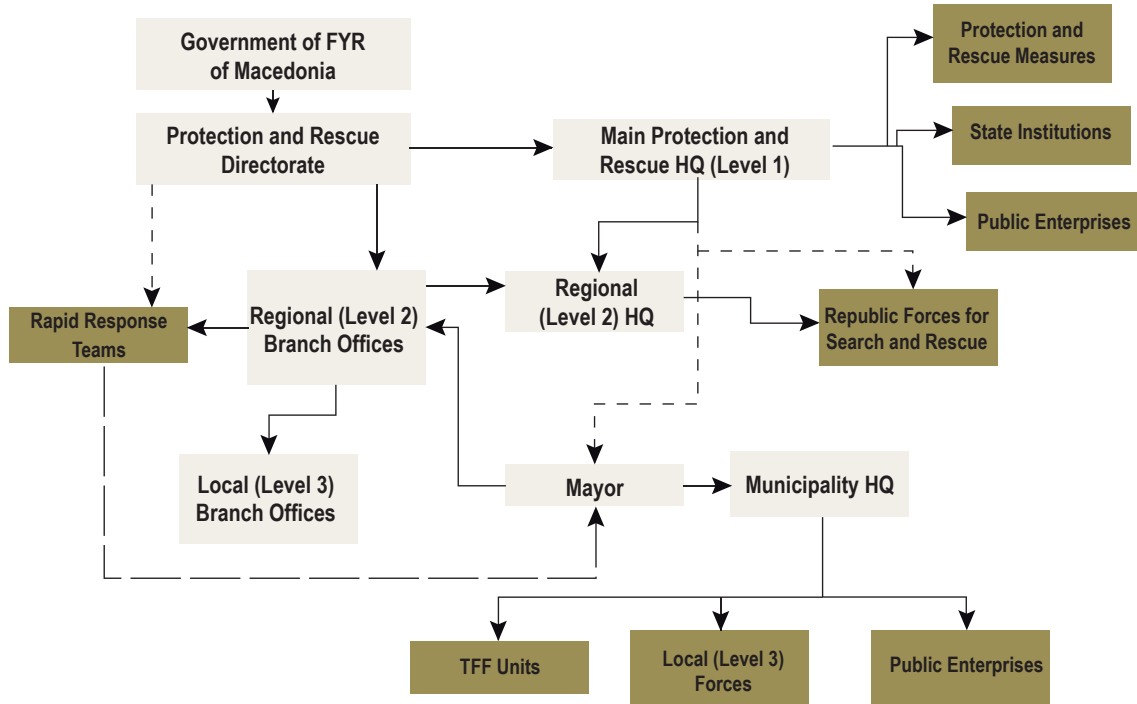
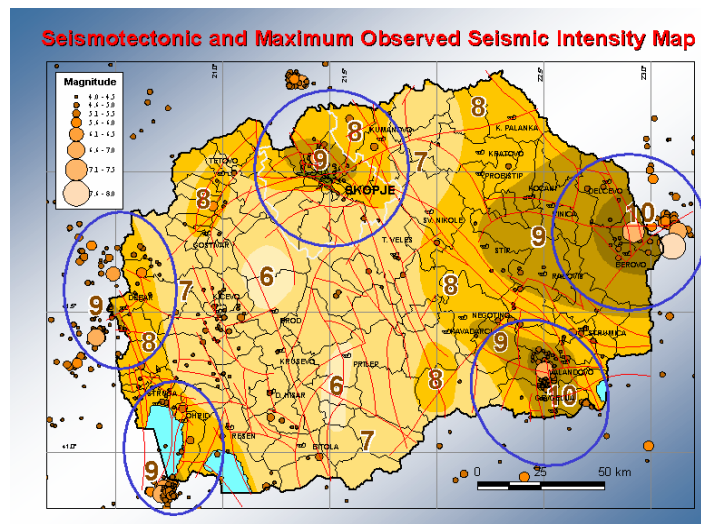


Figure 3.17 Seism-tectonic and maximum observed seismic intensity map<sup>134</sup>.



133 Courtesy of the FYR of Macedonia Protection and Rescue Directorate

134 Courtesy of the FYR of Macedonia Protection and Rescue Directorate.

Figure 3.18: Number of fires by year and size of area affected, 1998-2007<sup>135</sup>.

year	number of fires & area in hectares	total	year	number of fires & area in hectares	total
1998	Number of fires	151	2003	fires	193
	Affected area / ha	2,858		area / ha	2,281
1999	fires	90	2004	fires	161
	area / ha	1,465		area / ha	2,034
2000	fires	398	2005	fires	260
	area / ha	32,938		area / ha	3,360
2001	fires	255	2006	fires	185
	area / ha	7,311		area / ha	3,065
2002	fires	121	2007	fires	620
	area / ha	1,726		area / ha	39,162
total	number of fires	98-07	2,434		
	affected area / ha	98-07	96,204		

Earthquakes, floods and wildfires are among the natural hazards impacting the FYR of Macedonia. The distribution of earthquakes and their magnitudes can be seen in Figure 3.17, which is a seism-tectonic map of the country showing maximum observed seismic intensity.

Figure 3.18 shows the number of forest fires, and the size of the affected areas, that occurred in the period 1998-2007. Most forest fires occurred in 2007.

Standard legislation defining Civil Protection procedures relating to earthquakes refers mainly to the problems of mitigating damage to buildings, engineering structures and other facilities. The first seismic building codes, the Temporary Regulations for Construction in Seismic Regions<sup>136</sup>, came into force in 1964, following the Skopje earthquake of July 1963. The regulations, which were established in accordance with USSR seismic-resistant design codes, were developed through the use of generic qualitative

coefficients from the USSR and area-specific data gathered from the Skopje earthquake. Despite certain shortcomings, these regulations had a notable role in the seismic protection of buildings and contributed to focusing the professional engineering community's attention on the need to protect structures and buildings.

The Technical Regulations for Construction of Buildings in Seismic Regions<sup>137</sup> integrated the achievements of the Macedonian, Yugoslav and world scientific communities in the fields of seismology, engineering seismology and earthquake engineering and were a world-wide point of excellence at the time of their elaboration, in 1981. The experience gathered through compilation and analysis of effects of strong earthquakes on buildings and engineering structures was substantial, as was the experimental evidence considered on dynamic behaviour of structures during seismic activity. The strong motion network of accelerographs installed throughout the territory of Former Yugoslavia facilitated the study of the type and the intensity of possible seismic effects and

135 Courtesy of the Public Enterprise 'Macedonian Forests'.

136 Official Gazette of SFRY No. 39/64.

137 Official Gazette of SFRY No. 31/81 (including several amendments 49/82, 29/83, 21/88, and 52/90).

their characteristics<sup>138</sup>. The seismological network of the FYR of Macedonia consists of 5 permanent and 16 temporary stations. Of the 7 additional stations planned for instalment, 3 are under construction. The strong motion network consists of 106 SMA-1 accelerographs, of which 9 are located on bedrock (up to –120 m in depth), 19 are free-field instruments and 78 are placed in structures (10 buildings – 32 SMA-

1s, 11 dams – 34 SMA-1s, and three bridges - 12 SMA-1s). The seismological network is operated by the Seismological Observatory in the University Ss. Cyril and Methodius, Skopje.

However, the equipment used is in real need of improvement and upgrading. In particular, the following priorities were raised<sup>139</sup> during the visit to the FYR of Macedonia:

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138 For the ordinary categories of building structures, the Regulations prescribe definition of seismic forces by applying the method of equivalent static force (base shear approach), whereas for certain categories of structures (importance factor 1.5) and particular seismicity conditions ( $I=9+$ ) the method of dynamic analysis based on adequately defined time histories of ground accelerations is required. Defined in these Regulations are the bases for design and construction of seismically resistant structures, with a particular emphasis on reinforced concrete and masonry structures. The technical measures for repair, strengthening and reconstruction of high-rises (reinforced concrete and masonry structures) are defined by 'Technical Regulations for Repair, Strengthening and Reconstruction of Buildings Damaged by Earthquakes as well as Reconstruction and Revitalization of Buildings', Official Gazette of SFRY No. 52/85. Until 1982, the 'Seismic Zoning Map of SR. Macedonia', Official Gazette of SRM No. 2/79, defined the seismic zones. From August 1982 till 1990, the seismic zones were defined by the 'Temporary Seismological Map of SFRY', Official Gazette of SFRY No. 49/82, in which the earthquake intensity was defined by using the MCS (Mercalli-Cancani-Sieberg) scale. A conceptual modification of the seismological maps was made in 1988 when they were elaborated for return periods of 50, 100, 200, 500, 1,000 and 10,000 years, defining earthquake intensities according to the MSK-64 (Mevedev-Karnik-Sponhauer) scale. For building structures, the map elaborated for a return period of 500 years is enforced as official (Official Gazette of SFRY No. 252/9026). The concept, criteria and standards for protection of engineering structures against seismic effects are defined by the Technical Regulations for Design and Analysis of Engineering Structures in Seismic Conditions. The Regulations that are still to be published contain categorization of engineering structures, definition of seismic parameters, local soil conditions and methods for computation of seismic forces. Elaborated into details are the additional seismic effects like the hydrodynamic seismic pressure, inertial earth pressure of the soil masses for design of underground and embedded structures, as well as for different types of structures defined are load combinations for definition of extreme effects. Although the Regulations were finalized in June 1985, they are not in effect yet.

The elaboration of technical documentation, preparatory works and the construction/reconstruction, including the technical supervision of large investment structures are regulated by the 'Law on Construction of Capital Investment Facilities'. This law refers to construction of all building, infrastructure, lifeline, hydraulic civil engineering and other civil engineering structures, including all the installations, facilities and equipment which are in function of the purpose of the structure or solely the installations, the devices, the facilities and the equipment provided that they make a self-dependent technical-technological entity.

Requirements of this Law compensate for the yet-to-be-enforced Law on 'Technical Regulations for Design and Analysis of Engineering Structures in Seismic Regions' because for such facilities the special analyses are required and they are, with no exception, made by highly professional staff of the Institute of Earthquake Engineering and Engineering Seismology by implementing the state-of-the-art analytical techniques and standards.

Monitoring, recording and analysis of seismic effects, acquisition and processing of data on the manifestations of seismic phenomena upon the surface geological formations, the soil, the engineering and other structures as well as elaboration of seismological maps are regulated by the 'Law for Participation of the Republic in Financing the Seismological and Engineering Seismological Investigations', Official Gazette of SRM No. 18/83, as well as the 'Programs for Development and Improvement of Seismological and Engineering-Seismological Activities' in the period 1986 – 2005, renewed by law every 5 years.

- development of a Mobile Unit (MU) for post-earthquake damage and structural pathology assessment;
- extension and modernization of seismological instrument network;
- extension and modernization of obsolete (SMA-1) strong motion instrument network.

Protection against hydraulic hazards is regulated by the Law on Waters<sup>140</sup>, which includes 13 articles relating to floods, 12 relating to pollution and 8 relating to erosion.

The law applies to construction of protection facilities such as dykes and reservoirs, and includes regulations covering issues such as management of rivers, torrent channels and forestation, and protection of land from erosion. The planning of protective engineering facilities is the responsibility of the Public Water Management Company, which submits programme proposals to the relevant municipal authorities (*Level 3*), or city authority (*Level 2*).

Operational flood defence measures are outlined in the Plans of Operations for Protection and Defence against Floods in Threatened Areas, adopted by municipalities and the city of Skopje. The plans contain topographical, hydrological, hydrotechnical, demographic and economic data. They identify areas threatened by floods, detail measures and activities to be undertaken prior to flooding, and determine the authorities responsible for operations. The plans foresee appropriations necessary for their operative implementation. Copies must be submitted to the Ministry of Agriculture, Forestry and Water Management.

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139 Interview with Prof. Zoran Milutinovic (Institute of Earthquake Engineering and Engineering Seismology, IZIS-Skopje), and interview with officials of the Protection and Rescue Directorate.

140 Official Gazette No. 4/98, 'Law on Waters'.



In the event of a threat of dam or dyke failure, or discharge of larger quantities of water from reservoirs that could cause flooding, the Water Company must ensure that the public receives adequate alerts and information.

Before water levels reach critical points, it is the responsibility of the Republic Institute of Hydrometeorology to provide all relevant information to the Crisis Management Centre, assuring real-time forecasting of the flood levels. However, this function is impaired by inadequate funding and the need for organisational restructuring discussed earlier that are limiting the Institute's capacities. There is a real need for an extension and modernization of the flood gauge system and the network of meteorological stations operated by the Institute.

There is no a single law defining technical prevention measures for flood and landslide hazards. Rather, each is addressed indirectly by the Law for Territorial and Urban Planning<sup>141</sup> and the Law for Capital Investment Facilities<sup>142</sup>.

The Law for Territorial and Urban Planning prescribes the identification of flood- and landslide-prone areas, which is a particular task of the General Urban Plan. The identified flood- or landslide-prone areas are usually excluded from development.

Use of extra-urban areas for construction of large projects is regulated by the Law for Capital Investment Facilities<sup>143</sup>, which requires elaboration of documentation that identifies any environmental problems in the region surrounding the proposed location, along with elaboration of adequate studies at local level.

There is a strong need for the development and provision of countrywide GIS-based disaster risk information<sup>144</sup>. Access to such an information network would provide:

- substantial improvement of all-level planning processes;
- aggregate preparedness planning;
- effective and efficient operative management of daily problems;
- operative management and relief demands during disaster impact phase;
- continuous acquisition, analysis, archiving and interlinking of all necessary data and information for better understanding and qualification of Macedonian risk environment.

Until 1989, the prevention and suppression of forest and rural fires was based on forest management plans and the existing forest law<sup>145</sup>. However, the increased number of wildfires in former Yugoslavia from 1985, in particular along the Dalmatian Adriatic coastline (presently in Croatia), required the establishment of new legislation for prevention of forest and rural fires, which was enforced in 1989 as Regulations for Special Measures of Protection of Forests and Agriculture Land.

Despite the existence of a comprehensive legislative framework, there are still capacity gaps which restrict the ability of the fire-fighting service to manage the country's fire risk. Nevertheless, the Crisis Management Centre is establishing close coordination with all relevant CMS stakeholders in the field of forest fires. They are the: Ministry of Agriculture, Forestry and Water Management; Republic Institute of Hydrometeorology; Inspectorate for Forestry and Hunting; Protection and Rescue Directorate; relevant NGO federations (Red Cross, Fire-fighting Union of the Republic of Macedonia, Volunteer Fire-fighting Association); academic and expert groups (faculties, Disaster Crisis Management Centre of Excellence, National Laboratory Network); Rescue and Protection Forces; local self-governments; public and private enterprises; as well as the Ministries of Environment and Physical Planning, Interior, Foreign Affairs, Finance, Local Self-Government, Health and Defense.

Furthermore, the Government is in the process of acquiring three fire-fighting airplanes that will be operated by the Protection and Rescue Directorate.

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141 Official Gazette of SRM N. 4/96, and Amendments No. 28/97, 18/99.

142 Official Gazette of SRM N. 15/90.

143 *Ibid.*

144 Interview with Prof. Zoran Milutinovic (Institute of Earthquake Engineering and Engineering Seismology, IZIS-Skopje) and interview with official personnel of the Rescue and Protection Directorate.

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145 Official Gazette of SRM No. 20/74, 15/86, 51/88, 20/90 and Official Gazette of SRM No. 37/91, 44/91, 83/92.

The following points address areas in which fire-fighting capacities could be further developed<sup>146</sup>:

- capacity to manage fires in rural areas;
- capacity to manage fires in difficult-to-access mountain or forest terrain;
- development of a unique and uniform methodology for fire-damage inventories, data acquisition and loss estimation;
- enforcement of a unique national procedure and system for collection and processing of data on forest and range fires;
- reinforcement of the fleet of fire-fighting vehicles and heavy equipment for forest fires;
- development of new forest-fire protection mechanisms, including a fire-risk prediction system and fire-behaviour prediction system;
- development of bilateral, multilateral and regional cooperation in the field of forest fire-fighting.

A summary of the impact of natural hazards and the organisational response tools is provided in Table 3.14.

Table 3.14: Risk exposure and organisation in the FYR of Macedonia.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with event	Level 1	Level 1	Level 1	Level 1
degree of impact	high	medium	high	high
<b>preparedness</b>				
prediction system	yes, but needs development (A)	not applicable	yes, but needs development(B)	not applicable
vulnerability maps	no	no	yes, but need development	existing
<b>alerts and warnings</b>				
procedures	working at Level 1	not applicable	yes	not applicable
efficiency	low	no	medium	not applicable
public perception	low	no	medium	not applicable
<b>response and search and rescue</b>				
procedures	working from Level 1 to Level 2	no	working at Level 1	working at Level 1
efficiency	low	no	medium	medium
public perception	low	no	medium	medium

Notes to Table 3.14:

(A) The capacities of the Republic Institute of Hydrometeorology are being impaired by inadequate funding and the need for organisational restructuring.

(B) New forest-fire protection mechanisms are needed, including a fire-risk prediction system and fire-behaviour prediction system.

<sup>146</sup> Interview with Dr. T. Todorcevski (Rescue and Protection Directorate).

### 3.5.3 Human resources and costs

The FYR of Macedonia's disaster risk reduction commitment is considered a national concern and the country's prevention and mitigation strategy is realized through implementation of the following processes:

- physical planning including specific regional plans;
- general (master) and detailed urban planning of settlements;
- development of cadastral documentation for semi-rural and large rural settlements.

Procedures and modes for elaboration and adoption of plans are prescribed and have been respected for the past five decades. However, there is no single budget for disaster risk reduction. Instead, specific needs identified during the planning process are considered for incorporation into the national development programme. Should they be endorsed by the Government, the needs are addressed either by the responsible Ministry, or else by an

agency created for that particular need/project.

The Law for the Protection and Improvement of the Living Environment<sup>147</sup> identifies the Government as the principal sponsor of all risk prevention and protection measures relating to the improvement of the living environment in the FYR of Macedonia.

Funding for disaster risk reduction activities, especially those relating to prevention, mitigation, development and preparedness, is dispersed. It is a similar situation regarding funding for operational responses, with no account made of annual resource use or planned resource use.

The lack of a formal budget covering disaster risk reduction makes an assessment of human and technical resources problematic.

Costs are summarized in Table 3.15. The only information available concerns the cost of public servants normally involved in Civil Protection.

Table 3.15: Human resources involved in Civil Protection in the FYR of Macedonia.

HUMAN RESOURCES				
Level 1				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	262 <sup>(A)</sup> +211 <sup>(B)</sup>	no information available	no information available	215 <sup>(C)</sup> +5,705 <sup>(D)</sup>
% of the national active population	~0.034	-	-	~0.42
Level 2				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	no information available	no information available	no information available	no information available
% of the national active population	-	-	-	-

Notes to Table 3.15:

(A) Protection and Rescue Directorate.

(B) Republic Institute of Hydrometeorology.

(C) Fast-response teams for rescue and protection.

(D) Units for Rescue and Protection.

147 Official Gazette of RM N. 51/00.

Table 3.16: Average annual costs of the Civil Protection system in the FYR of Macedonia.

ANNUAL COSTS							
Level 1							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of Fire Brigade due to activities during 'emergency periods'	percentage cost of Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	~2.0	no information available	no information available	no information available	no information available	no information available	>3
% of the national GDP	~0.015	no information available	no information available	no information available	no information available	no information available	~0.02
Level 2							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection		
euros (millions)	no information available	no information available	no information available	no information available	no information available	no information available	
% of the national GDP	no information available	no information available	no information available	no information available	no information available	no information available	
research and development							
	investment for university departments, research agencies and/or organisations working for Civil Protection	maintenance for university departments, research agencies and/or organisations working for Civil Protection	public or private companies supplying hardware and software				
euros (millions)	no	1.4 ( Republic Institute of Hydrometeorology, 70% on salaries)	no				

### 3.5.4 – Civil Protection and society

The academic and research communities in the country are linked to both local and national institutions dealing with disaster reduction.

It is through the development and planning process that different elements of Civil Protection are linked, with the process acting as an ‘umbrella’ connecting the different parts. The elements include the Development Plan of Macedonia; the Spatial Plan of Macedonia; the General Urban Plans and Detailed Urban Plans of larger settlements; and the cooperative frameworks established by the specialist protection systems.

Officials of the Civil Protection Directorate expressed the hope that the Law for Crisis Management will provide a legal framework for cooperative links between academic and research communities and national and local

institutions dealing with disaster reduction, in particular with the national Crisis Management System<sup>148</sup>.

The Crisis Management System is being improved through a crisis management network based on cooperation agreements among crisis management stakeholders and integration of resources. The crisis management network includes governmental and non-governmental institutions on a national and local level. In this way, a National Platform for disaster risk reduction is being established, with the Crisis Management Centre as its Focal Point.

It is also worth mentioning that, through the Ministry of Education and Science, a number of public training projects have been developed targeting primary- and secondary-level pupils. They include:

148 Interview with official personnel of the Rescue and Protection Directorate.

- the project ‘Let us be Acquainted with Natural Catastrophes 1997/98’, for pupils aged 7 to 10;
- the project ‘International Cooperation and Connection of Schools in Southeast Europe through the Internet’. This has been realized in 9 high schools in the FYR of Macedonia, connected with 10 schools from each of the 10 countries of South East Europe. The goal of this project was to develop common themes in the sphere of prevention and protection against catastrophes caused by natural or technological hazards.

The Crisis Management Centre is in the process of setting up a national crisis management educational and training network. This will include universities, vocational schools, and other educational institutions such as the Military Academy and police training facilities (by planning to interpolate crisis management modules in their existing curriculums). The CMC is developing a concept for a virtual Crisis Management Academy, employing the existing educational facilities nationwide.

A Disaster Crisis Management Centre of Excellence is being established at the State University of Ss. Cyril and Methodius – Skopje, to engage the scientific knowledge and resources in the Crisis Management System.

The decentralization of the planning process is transferring substantial competences from central Government to municipalities, but there remains a need to strengthen cooperative links between academic and research communities and local authorities.

In terms of cross-border activities, the FYR of Macedonia actively pursues international cooperation in the field of Civil Protection. Negotiations are ongoing to define bilateral collaboration in Civil Protection with Croatia, France and Hungary. Progress has been made in bilateral cooperation and building mechanisms for cooperation with other National Platforms. A cooperation agreement in the area of prevention, limitation and mitigation of the consequences of disasters, with Turkey, was signed. In addition, memorandums of understanding have been signed between the Republic Institute of Hydrometeorology and the following organisations: the Hydrometeorological Institute of Albania, the National Institute for Meteorology and Hydrology of Bulgaria, the Republic Hydrometeorological Service of Serbia and Montenegro, and the State Hydrometeorological Institute of Croatia. Collaboration is also ongoing with Deutscher Wetter Dienst (DWD), of Germany.

### 3.6 Moldova

#### *Public perception of Civil Protection*

Civil Protection in Moldova is viewed in terms of ‘protection and rescue’ and its provision is governed by legislation and decrees. The Government of the Republic of Moldova is responsible for protecting people and assets in emergency situations and for the organising of population preparedness and Civil Protection forces in order to conduct operations in the event of crises.

The Law on Civil Protection states that the citizens of Moldova, foreign nationals and stateless people residing in the territory of the Republic have, in emergency situations, the right to protection of life and health through material and financial assistance donated either individually or collectively. Moreover, each citizen has the right, as well as an obligation, to be trained in protection and rescue and to receive full and timely information about all threats of disaster, as well as all available protection measures and activities.

The legal right of foreigners to receive assistance in case of disasters is transparent and is more clearly articulated in Moldovan legislation than is common among South Eastern European countries. The planned adoption in the near future of the European emergency number 112 is a further move in this direction.

It should be noted that there is a great tradition of volunteering for fire-fighting duties in the event of industrial accidents, although the exact number of volunteers is not available for reasons of internal security. Such emergencies have represented the biggest perceived risk since the Communist period.

#### *Demography and administration*

Moldova has a population of almost 4.3 million people, giving it an order of magnitude of *Level 1* according to the classification used in this review<sup>149</sup>.

149 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

The country is divided into 32 regions, plus the municipality of Chisinau, which is the capital city and has a population of 800,000, and the two smaller municipalities of Bălţi and Bendery (also known as Tighina). Each region has a local office of Civil Protection and is responsible for certain protection and rescue services, mainly in connection with the fire-fighting sector. In terms of the Civil Protection structure, regions correspond to *Level 3*.

At *Level 2* there is system of 10 territorial Commissions for Emergency Situations, each of which covers 2 or 3 regions. Although the size of the Directorates varies, they each have an order of magnitude of *Level 2*. Each territorial Directorate includes a rescue unit.



#### 3.6.1 – Legislation

Since its declaration of independence in 1991, the young Moldovan state has taken significant steps to establish a modernized and reformed administrative structure. This process of harmonization of the legislation of Moldova with the new situation and with EU standards has had a direct impact on disaster risk reduction and Civil Protection.

150 Courtesy of en.wikipedia

Civil emergency management in Moldova is regulated by two acts: the Law on Civil Protection<sup>151</sup> and the Law on Defence against Fires<sup>152</sup>.

The Law on Civil Protection defines the basic principles for the organisation of civil defence at all levels, and establishes its tasks and the legal framework that public authorities, institutions, private enterprises, organisations and citizens have to operate within.

The following is a brief examination of two areas of particular interest in the Law on Civil Protection, and subsequent versions of it, relating to *Level 1*. The first issue concerns categorization of the scale of events producing emergency situations. Events are grouped into one of three categories:

- Events whose consequences can be faced with the resources available at Level 3, in the case of a single region, for which the responsibility is that of the local mayor as chairman of the Local Commission for Emergency Situations.
- Larger events, which cannot be dealt with at Level 3 and require the intervention of Level 2 organisations. Responsibility at this level is with the head of the local public management authority, which is the Territorial Commission for Emergency Situations.
- Events that are particularly intense and involve several territorial Directorates. They are classified as Level 1 and responsibility for the management and coordination of human and technical resources for relief operations, and search and rescue, lies with the chair of the Commission for Emergency Situations of the Central Public Management Authority, who is the President of the Council of Ministers.

The second issue concerns the ongoing efforts to transform the former centralized system to a decentralized one. This concerns the organisation of the competences of the system of Civil Protection in an ensemble of different authorities, administrations and public/private bodies. This includes Government and Parliament, and the Department of Civil Protection and Emergency Situations, the Ministry of Healthcare and the Ministry of Transport.

When the law was introduced, the Department of Civil Protection and Emergency Situations was under the

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151 Official Gazette of Moldova, No. 20/1994.

152 Official Gazette of Moldova, No. 15/1995.

Ministry of Defence. But in 1997 the Department was expanded to include the Department of Fire Fighters, and in June 2005 the combined Department of Civil Protection and Emergency Situations was transferred to the jurisdiction of the Ministry of Internal Affairs.

The Law on Defence against Fires defines the legal, economic and social framework to ensure fire safety and fire protection in Moldova, and regulates relations in the field of combating fires.

The following public sector actors are identified in the area of fire safety: the Government, the Office of Fire Emergency, the Rescue Service (within the Department of Civil Protection and Emergency Situations) and local public administrations.

The responsibilities of enterprises are defined in great detail as part of measures aiming to ensure the implementation of, and compliance with, fire standards, technical regulations, and rules of fire safety in the design, construction and repair of facilities, as well as in the manufacture, transport and use of products.

### 3.6.2 Civil Protection structure

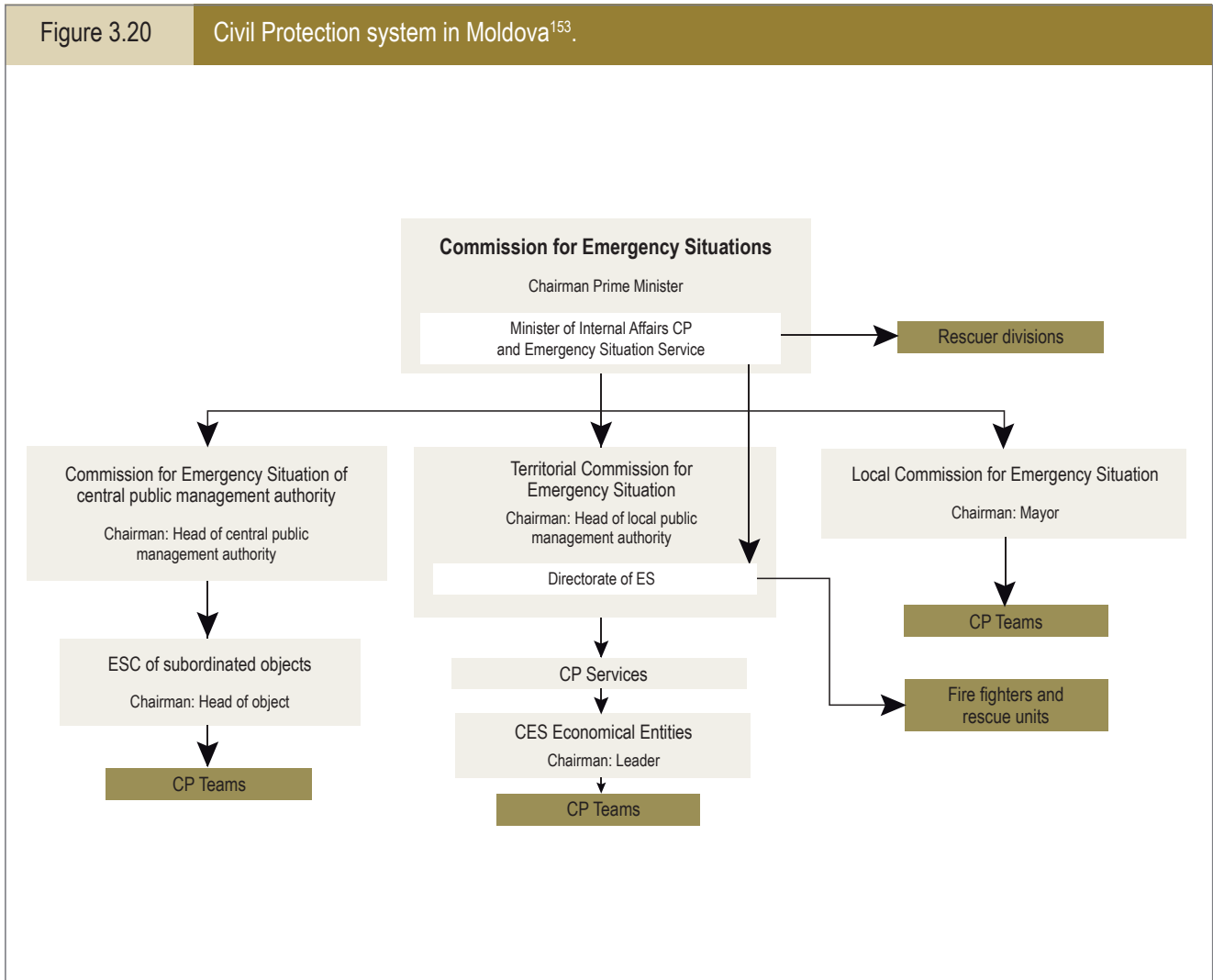
The Moldovan Civil Protection system is under the Ministry of Internal Affairs. National-level emergencies are the responsibility of the Commission for Emergency Situations, with the Prime Minister as Chairperson. The role of Deputy Chairman is occupied by the Minister of Internal Affairs. Three main levels of emergency are defined as national (*Level 1*), regional (*Level 2*) and local/municipal (*Level 3*).

Regional (*Level 2*) emergencies are dealt with by the Territorial Commission for Emergency Situations, while emergencies in single municipalities (*Level 3*) are the responsibility of the Local Commission for Emergency Situations, whose chairperson is the mayor.

The main aims of the Civil Protection system are the protection of people and property through the following prevention and response activities: civil emergency planning, search and rescue operations, issuing of alerts and information, maintenance and use of protective means, risk and capacity assessment, education and training, preparedness, mitigation of disaster consequences and rehabilitation. The system's structure is shown in Figure 3.20.

The Civil Protection and Emergency Situation Service

Figure 3.20 Civil Protection system in Moldova<sup>153</sup>.



plays a crucial role in the Civil Protection of Moldova. With an annual budget of approximately €2.5 million, most of which is spent on salaries, fuel and uniforms, the Service has a staff of over 2,800, including 85 managers and nearly 1,300 specialists. The Service is responsible for the in-house training of its personnel, with training course lengths ranging from 21 hours for heads of non-military units to 70 hours for Civil Protection specialists. The training courses are held at the National Training Centre and its branches.

The Service includes 3 search and rescue units, 50 fire stations and 2 garages, with a total of 320 vehicles. However, there are capacity gaps and vehicles and

machinery need updating. None has been renewed since 1991. The structure of the Service is shown in Figure 3.21.

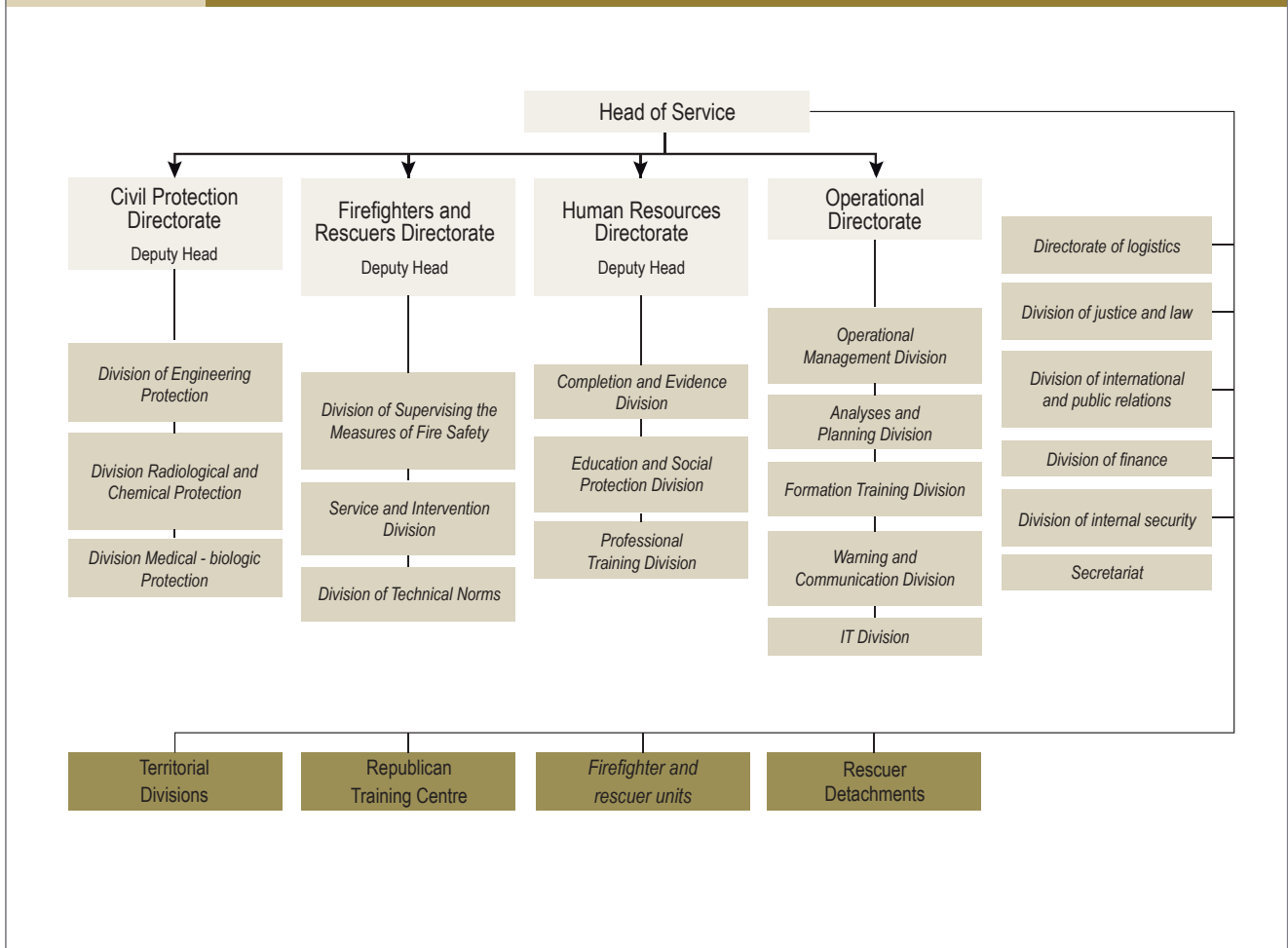
The Disaster Medical System was established as part of the National Public Health System to deliver adequate and efficient responses to the range of possible health risks associated with emergency events. It is responsible for managing health risks from events including floods, earthquakes, fires, highly dangerous infectious diseases, and accidents or criminal and terrorist acts involving explosives, chemicals, radioactive substances or biological threats.

The Disaster Medical System develops the national health emergency response plans. Its tasks and activities include:

153 Courtesy of the Civil Protection and Emergency Situation Service.



**Figure 3.21** The Civil Protection and Emergency Situation Service. Assets operating at *Level 2* and *Level 3* are explicitly indicated, with the remainder intended for use only at *Level 1*<sup>154</sup>.



- to assess health risks and to coordinate emergency services;
- to provide medical intelligence and carry on surveillance in order to identify and track possible threats to public health;
- to test and validate emergency arrangements, and to develop domestic health safety regulations;
- to coordinate responses to natural or technological disasters, including terrorism-related incidents and dangerous health threats requiring quarantine measures and/or travel restrictions.

As with the Civil Protection System, the Disaster Medical System is also organised on the three levels *Level 1*, *Level 2* and *Level 3*. The structures at the various levels are shown in Figures 3.23, 3.24 and 3.25.

The System includes a series of Emergency Medical Centres distributed around the country, as shown in Figure 3.22. At its core is the National Scientific and Practical Centre for Preventive Medicine (NSPCEM).

<sup>154</sup> Courtesy of the Moldovan Civil Protection and Emergency Situation Service.

Figure 3.22 Emergency Medical Centres in Moldova<sup>155</sup>.

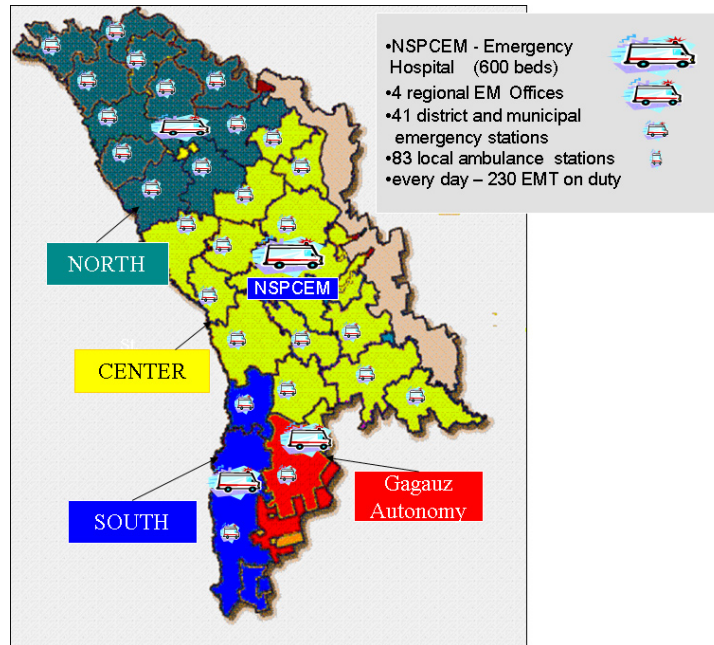
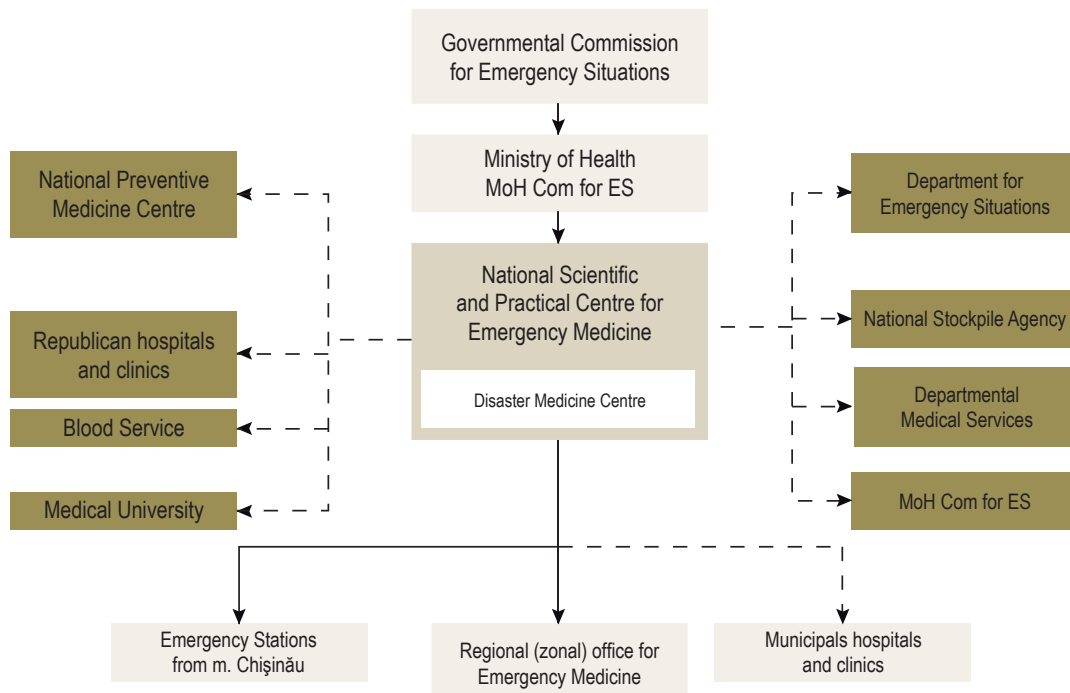


Figure 3.23 Disaster Medical System at Level 1<sup>156</sup>.



155 Courtesy of the Ministry of Healthcare.

156 Courtesy of the Ministry of Healthcare.

Figure 3.24 Disaster Medical System at Level 2<sup>157</sup>.

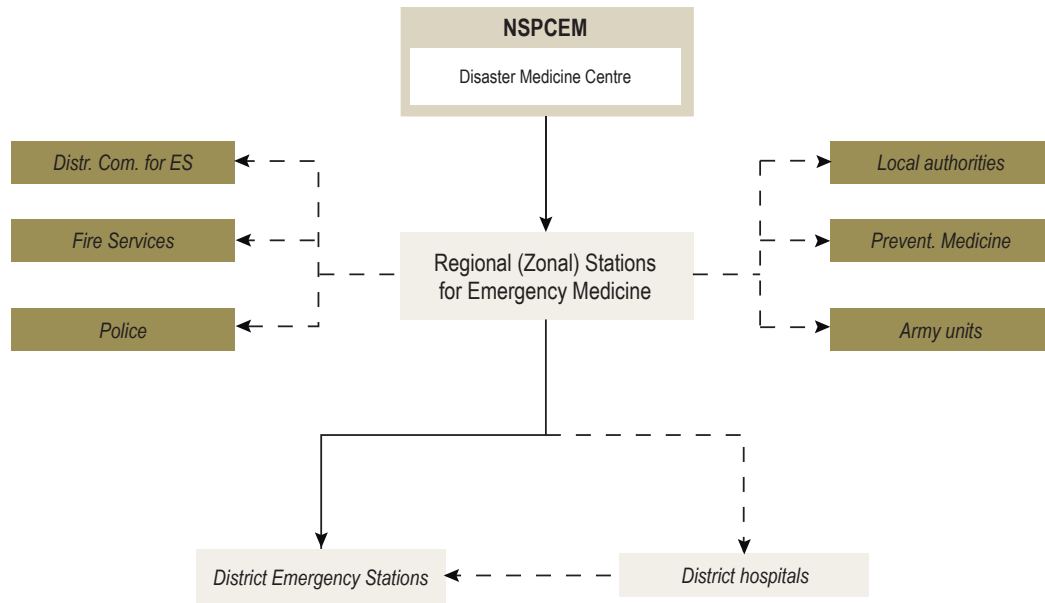
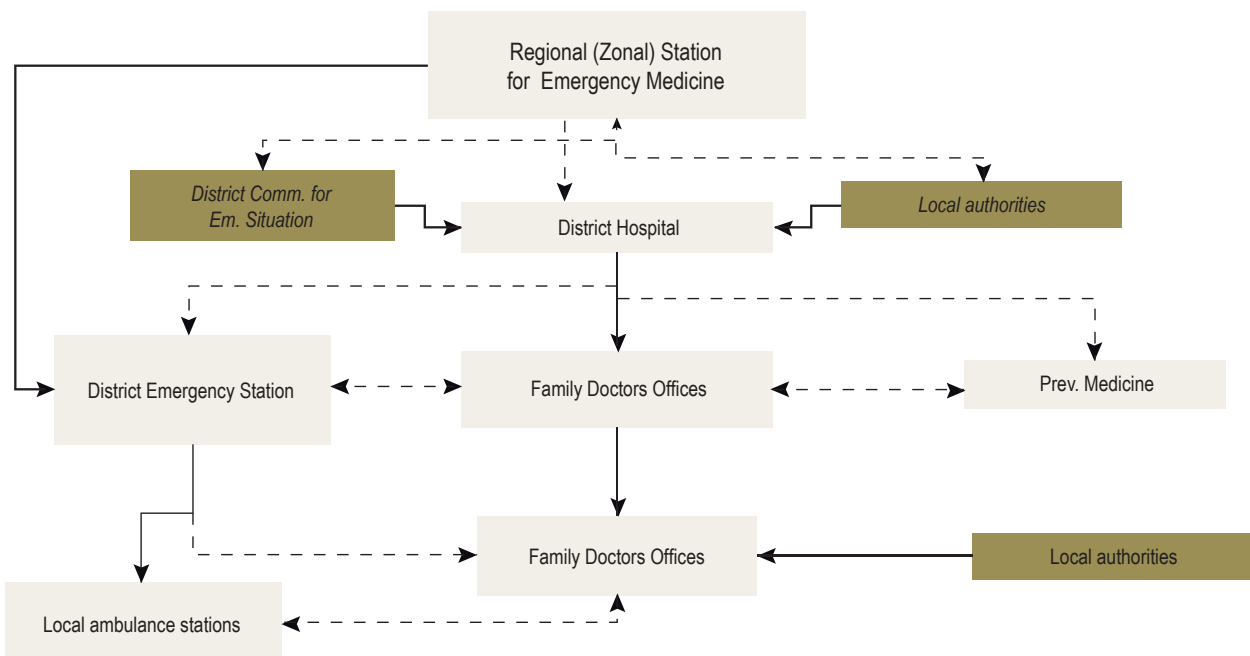


Figure 3.25 Disaster Medical System at Level 3<sup>158</sup>.



157 Courtesy of the Ministry of Healthcare.

158 Courtesy of the Ministry of Healthcare.

With regard to natural hazards, Moldova is highly vulnerable to floods and other hazards including storms, landslides and earthquakes. However, the country does not yet have an effective early-warning system to allow people exposed to hazards to take appropriate action to avoid or reduce their risk and prepare an effective response.

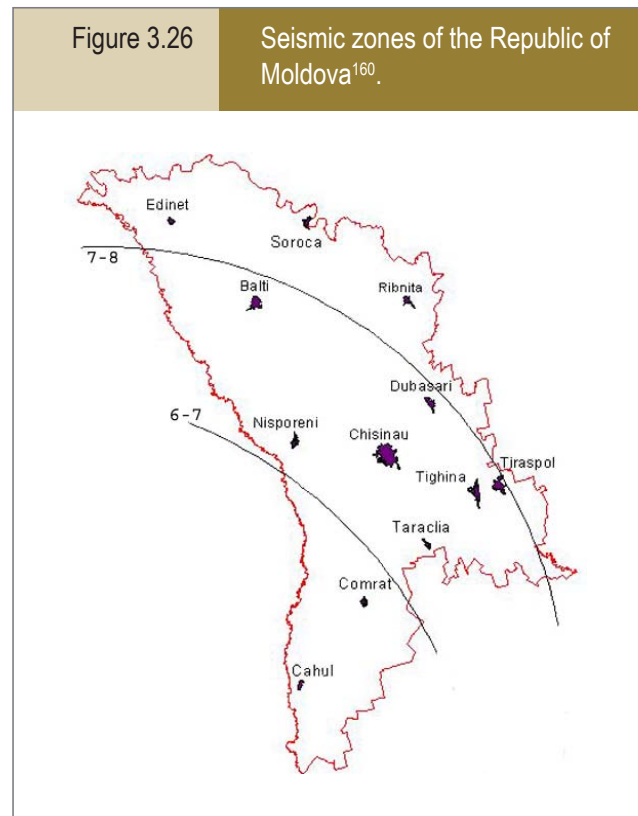
An effective early-warning system should include mapping of hazards, monitoring and forecasting of impending events and disseminating warnings to the authorities and the public. But in Moldova several of these ingredients are missing and others, such as mapping of hazards, monitoring and forecasting of impending events, are in need of updating. The existing early-warning system is mainly limited to the dissemination of warnings to the population through an outdated network of sirens, a legacy of the former Soviet period.

On the other hand, some attempts are made at a political level to facilitate preparedness by collecting information regarding the needs and means of the population in a bid to protect livelihoods<sup>159</sup>.

The Republic of Moldova is situated in a seismic zone where earthquakes have reached magnitude 8-9 on the Mercalli scale (USRR mapping, Figure 3.26). During the last 200 years Moldova has been affected by 18 earthquakes of magnitude 7-9.

Of the most recent seismic events, the earthquake which struck in March 1977 had a Mercalli scale magnitude of 7-8 and caused huge material losses, as well as 200 casualties. An earthquake in August 1986 caused even greater damage, with over 5,000 houses, 200 schools and 65 medical facilities including hospitals destroyed or damaged. Casualty figures were also higher. The last earthquake, in May 1990, also caused very significant material damage.

In common with emergency search and rescue procedures involving other natural hazards, those covering earthquakes are limited due to strong economic constraints.



There are approximately 16,000 areas nationwide affected by landslide hazards. The central region of the country and the Tigheci plateau have suffered the greatest number of landslides, and over 1,500 of the areas at risk are located within settlements. The populations of around 50 villages need to be relocated to safer land to avoid danger.

Between February and March 1998 there was an especially intense period of landslides in the central part of Moldova, including Chisinau. In all about 360 private homes were damaged, including 200 destroyed, and 1,400 inhabitants were affected. Total material damage amounted to €5 million.

A catastrophic landslide which struck the village of Ghiliceni in the Balti district in March 1999 destroyed 60 houses and wiped out 2 km of roads and 5 km of power lines.

Protection against hydraulic hazards is regulated by a series of water codes<sup>161</sup>. The codes establish

<sup>159</sup> Decree 347/03 'On collecting and exchange of information designated for protection of the population and territories in emergency situations'.

<sup>160</sup> Courtesy of the Moldovan Civil Protection and Emergency Situation Service.

<sup>161</sup> The Law on 'Rivers and lakes protection zones and bands', April 27 1995; Decree 1202/01 'On some regulatory measures on exploitation of water resources'; and Decree 1030/00 'On the protection scheme of settlements from floods'.

Table 3.17: Risk exposure and organisation in Moldova.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with event	Level 1	Level 3	Level 2	Level 1
degree of impact	high	medium	minor	high
<b>preparedness</b>				
prediction system	no (A)	not applicable	no	not applicable
vulnerability maps	no (A)	not applicable	no	not applicable
<b>alerts and warnings</b>				
procedures	working at Level 1	working at Level 1	no	not applicable
efficiency	low(A)	not measurable	no	not applicable
public perception	low (A)	not measurable	no	not applicable
<b>response and search and rescue</b>				
procedures	working from Level 1 to Level 3	yes	no	working at Level 1 and Level 3
efficiency	low	low	no	low
public perception	low	low	no	low

Notes to Table 3.17:

(A) The public warning system is essentially based on an old system of electrical sirens. The lack of an NWP system at the State Hydrometeorological Service (SHMS) limits the reliability of messages.

responsibilities for protection against floods and other inundations, damage to river banks, dams and other hydraulic facilities, soil erosion and landslides. As well as measures to prevent floods, the codes establish measures to mitigate their consequences.

The summer droughts which historically affect Moldova have necessitated the construction of over 3,000 reservoirs, mostly built during the Soviet era. Several are now in a state of disrepair and constitute a risk to settlements located downstream. Estimates suggest that approximately 170 settlements are at risk from these facilities, with a combined population of 160,000.

In total, there are 659 settlements exposed to the risk of flooding, including 625 villages, 31 cities and 3 municipalities. Over 27,000 homes and over 1,600 industrial units are at risk. The cost of relocation is estimated at 4.2 billion *Leu* (€313 million).

Floods have caused the biggest losses of all the disaster events to strike Moldova. The floods of 1991, left 21

people dead and approximately 8,000 homes damaged, over 500 of which were destroyed. Material damage was estimated at 700 million *Rubles* (€17 million).

In August 1994 intensive rain and strong wind caused localised flooding on a number of small water courses. The result was devastating with over 30 people killed and upwards of 3,000 houses damaged, over 800 of which were destroyed.

Technological hazards represent a considerable problem for Moldova as it attempts to deal with a legacy of contaminated military sites, toxic waste and the Chernobyl accident.

Hazards include the risk of dam collapse, industrial accidents and communication and technological network failures, as well as the risks associated with the transport of dangerous substances, pollution and nuclear waste. Furthermore, Moldova's military inheritance includes something like 20,000 tonnes of arms and munitions stocked in Transnistria, which will be hard to dispose of.

According to the Organisation for Security and Cooperation in Europe (OSCE) in a report released in 2007, toxic waste, water pollution and the legacy of Chernobyl have plunged Moldova into an environmental crisis<sup>162</sup>. The organisation found that as well as 1 million tonnes of industrial waste Moldova has 8,000 tonnes of toxic residues contributing to land and water contamination<sup>163</sup>. Up to half of ground water is contaminated and the situation is even worse for surface water, which is affected by a wide variety of pollutants including ammonia, nitrites, phenols and oil products.

With regard to nuclear hazards, although Moldova has no nuclear power stations of its own its proximity to the nuclear facilities of neighbouring countries including Romania and Ukraine mean that the risk of exposure is quite high.

Moreover, although the dissolution of the Soviet Union has eased certain environmental pressures it has exacerbated others through increased exploitation of natural resources and lax regulation.

Decree 477/00, 'On the national network of observation and laboratory control of environmental pollution with chemical, biological and radioactive materials', regulates technological hazards in Moldova.

### 3.6.3 Human resources and costs

As in the FYR of Macedonia, the budget for disaster risk reduction is limited and dispersed, particularly

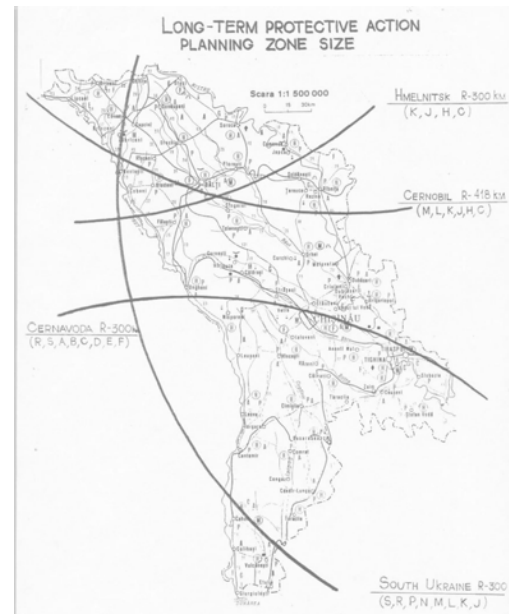
162 Cherp A., ANTYPAS A., CHETERIAN V., SALYNKOV M. (OSCE), *Transforming Risk into Cooperation. The case of Eastern Europe: Belarus-Moldova-Ukraine*, May and June 2006

163 Ibid.

164 Courtesy of the Moldovan Civil Protection and Emergency Situation Service

Figure 3.27

Radiative zoning<sup>164</sup>.



in the domains of prevention, mitigation and preparedness, and operative response capabilities. There has been a strong contraction in the personnel levels of the Civil Protection and Emergency Situation Service during recent years.

This situation hinders an accurate assessment of human and technical resources involved in the functioning of Civil Protection in Moldova (Table 3.18).

### 3.6.4 Civil Protection and society

In common with fellow South Eastern European countries Albania and the FYR of Macedonia, Civil Protection research and development activities in Moldova would benefit from enhanced support. There is a need to foster scientific and research interaction among the universities and institutions contributing to environmental management and disaster risk reduction. The academic and research communities in the country are not yet linked to national or local institutions dealing with disaster reduction.

Table 3.18: Human resources involved in Civil Protection in Moldova.

HUMAN RESOURCES				
Level 1				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	~2,820	no information available	no information available	2,820+250 <sup>(A)</sup>
% of the national active population	0.11	-	-	0.12
Level 2				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	no information available	no information available	no information available	no information available
% of the national active population	-	-	-	-

Notes to the Table 3.18:

(A) Fire-fighter personnel.

Table 3.19: Average annual costs of the Civil Protection system in Moldova.

annual costs							
Level 1							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of Fire Brigade due to activities during 'emergency periods'	percentage cost of Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	2.5	no information available	no information available	no information available	no information available	no information available	2.5
% of the national GDP	0.033	no information available	no information available	no information available	no information available	no information available	0.033
Level 2							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	operational cost of equipment, technologies and emergency assets		average annual cost of post-emergency recovery	total funding for Civil Protection	
euros (millions)	no information available	no information available	no information available		no information available	no information available	
% of the national GDP	no information available	no information available	no information available		no information available	no information available	
research and development							
	investment for university departments, research agencies and/or organisations working for Civil Protection		maintenance for university departments, research agencies and/or organisations working for Civil Protection		public or private companies supplying hardware and software		
euros (millions)	none		0.5 (SHMS, 70% salary) + 0.05 (MoldATSA meteorological department) + 1.0 (Anti-hail Service)		none		

In terms of cross-border activities, Moldova is involved in a number of bilateral agreements with neighbouring countries. They include:

- Agreement between Moldova and Russia for collaboration in the field of Civil Protection (1995);
- Agreement between Moldova and Russia for collaboration in search and rescue operations in case of 'natural' and man-made disasters (1996).

Moldova has also participated in the following international training exercises:

- Ukraine – 'Transcarpatia-2000', Ujgorod;
- Russia 'Bogorodsk-2002', Noginsk;
- Romania 'Dacia-2003', Pitesti;
- Ukraine 'Rough and Ready – 2006', Odessa;
- Serbia 'IDASSA – 2007', Beograd.



## 3.7 Montenegro

### *Public perception of Civil Protection*

Natural and technological hazards including earthquakes, floods, landslides, forest fires and industrial incidents represent a considerable threat to the Republic of Montenegro. The recent urban sprawl and the industrial growth of the country have exposed an increasing number of people to the potential consequences of these hazards.

The Government is well aware of the positive impact that efficient management of risks could have on the country's development, especially for the sectors of tourism and industry, which depend on a secure environment, and has embarked on a thorough restructuring of the Civil Protection sector. Currently, Civil Protection is evolving, starting from a system of search and rescue based on the establishment of local units, towards a model focused on disaster prevention.

### *Demography and administration*

Montenegro has a population of 650,000 people, giving it an order of magnitude of *Level 2* according to the classification used in this review<sup>165</sup>. The country, with a total area 14,000 km<sup>2</sup>, is divided into 21 municipalities (Ospine). The capital city Podgorica, which has a population of 130,000, and the city of Niksic, with a population of 58,000, account for almost one third of the total national population.

Populations of municipalities are small and the average is under 10,000 people. Nevertheless, for the purposes of this review the municipalities are classified as *Level 3* administrations.

### 3.7.1 Legislation

Following the dissolution of the Socialist Federal Republic of Yugoslavia (SFRY) in 1992, Montenegro federated with Serbia, first as the Federal Republic of Yugoslavia and subsequently, after 2003, in a looser union of Serbia and Montenegro established by adoption of the Law on Implementation of the Constitutional Charter.

Since 2003, and following the declaration of its independence on 3 June 2006, the Parliament of Montenegro approved a number of laws and regulations with the aim of modernizing the old jurisdiction of the SFRY, as well as introducing new State competences. However, the legislation in force is still based on a large number of laws, regulations and decrees approved and implemented by the parliament of SFRY both in the frameworks of geophysical risk<sup>166</sup>, meteorological risks<sup>167</sup>, and industrial and technological risk.

Within this framework Civil Protection represents a critical issue for the State, since historically Montenegro has suffered the dramatic effects of natural and technological disasters that have caused huge damage and suffering.

Specific laws relevant to Civil Protection have been approved, namely the Law on Rescue and Protection

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166 Legislation includes: Regulations on Technical Norms for Building Construction in Seismic Areas (Official Gazette of SFRY no. 31/81 with amendments no. 49/82, 29/83, 21/88 and 52/90); Regulations on Technical Norms for Building Construction in Seismic Areas (Official Gazette of SFRY no. 52/90); Law on Civil Defense (Official Gazette of SFRY no 8/83, 27/87, 33/88, 34/91); Regulations on the Establishment of Work Units for Protection against Natural Disasters (Official Gazette of SFRY no 11/86); Decree on the Organization and Proficiency of Civil Protection Units and Protection and Rescue Measures for Civil Population and Material Assets (Official Gazette of the FRY no 54/94); Decree on the Establishment of the National Notification Centre (Official Gazette of Republic of Montenegro no 3/84); Guidelines on Unique Methodology for Assessment of Damages Caused by Natural Disasters (Official Gazette of the SFRY no 27/87); Decision on the Establishment of a Commission for Natural and Technological Disasters (Official Gazette of the FRY no 27/95); Decision on the Conditions and Criteria for Extending Assistance to Remove the Consequences of Natural Disasters (Official Gazette of the Republic of Montenegro no 15/93); Decision on the Establishment and Composition of the National Civil Protection Headquarters (Official Gazette of the Republic of Montenegro no 37/91); Law on Restoration and Revitalization of Old Towns Damaged in the Disastrous Earthquake of 15 April 1979 (Official Gazette of Republic of Montenegro no 10/84); Law on Banning the Trade of Property Owned at Specific Municipalities (Official Gazette of Republic of Montenegro no 16/79); Regulations for Restoration of Buildings Damaged in Earthquake (Official Gazette of Republic of Montenegro no 18/79); Decree on Restoration of Buildings Damaged in Earthquake in SRM (Official Gazette of Republic of Montenegro no 15/79); Decision to Determine Areas Where Special Procedure for Expropriation of Property Due to Natural Disasters Will be in Place (Official Gazette of Republic of Montenegro no 15/79) and Regulations on Technical Norms for Restoration, Reinforcement and Reconstruction of Building Constructions Damaged by Earthquake and for Reconstruction and Revitalisation of Building Constructions (Official Gazette of SFRY no 52/85).

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165 The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

167 The Law on Hydro-meteorological Affairs of Interest to the Entire Country (Official Gazette of SFRY, number 18/88 and 63/90); Defense Law of the Federal Republic of Yugoslavia (Official Gazette of the FRY, number 18/88 and 63/90); The Law on Air Traffic (Official Gazette of the FRY, number 12/98); The Law on Waters Regime (Official Gazette of the FRY, number 59/98); The Law on the System of Statistical Surveys (Official Gazette of the FRY, number 80/94 and 28/96).

activities in Montenegro<sup>168</sup>, and the Law on Transportation of Dangerous Goods<sup>169</sup>, while a draft law dealing with the storage and the transport of explosive and inflammable liquids was scheduled for adoption in July 2008.

The National Strategy for Emergency Situations, adopted by the Government of Montenegro in December 2006, can be considered as a foundation document for the modern structure of Civil Protection in Montenegro. The National Strategy analyses all the risks affecting the territory of Montenegro, providing a survey on the actual capacity of the Montenegrin structures to cope with them. The survey highlights the operational capabilities of Montenegro with reference to the major risks on its territory, emphasizing the importance of constant monitoring of the hazards and the need for an integrated approach to disaster risk reduction.

### **3.7.2 Civil Protection structure**

In December 2004 the Government adopted a new regulation on changes and amendments to the State administration<sup>170</sup>. Under the terms of the new regulation the Ministry of Interior and Public Administration was made responsible for risk management, preparedness and search and rescue in cases of earthquakes, fires and other natural or technological incidents.

The regulation also established the Sector for Emergency Situations and Civil Security, in the Ministry of the Interior and Public Administration, as a unique body to coordinate Civil Protection in Montenegro. The Sector has five departments and two operational units. They are:

- The Department for Civil Protection. Its main duty is the identification and evaluation of the risks at national and local level, and the implementation of standard operational procedures for protection and rescue, usually based on the establishment of specific local Civil Protection Units. This Department has jurisdiction over the monitoring of the adoption of legislation, public education and awareness, and the training of civil defence personnel.
- The Department for Risk Assessment. It is responsible for the management of the national database of the risks as reported by the National Strategy for Emergency Situations. The duties of the Department encompass the drafting and development of strategic documents and plans at national or inter-municipal levels, cooperation with scientific bodies (universities), laboratories and other research institutions.
- The Department for Prevention and Inspection. It has jurisdiction over the activities defined by the Law on Protection and Rescue and other regulations related to this area, including the construction of new buildings, the surveillance of warehouses containing dangerous substances, the transport of dangerous goods and military equipment, and the management of weapons.
- The Department for Operational Affairs. It is in charge of the coordination of all organisations, companies, and State or local authority institutions in emergencies. The Department provides municipal departments for protection and rescue and Civil Protection units with the equipment and training needed to cope with all types of risk.
- The Department for Strategic Policies and Legal Affairs. It defines the guidelines for strategies and programmes, and proposes draft laws relevant to the organisation and the functioning of Civil Protection and monitors their realization. The Department is responsible for the harmonization of the regulations and laws in force in Montenegro with reference to EU regulations and international standards in the field of Civil Protection.
- The 112 Centre. The Centre, which was expected to be operational by the end of 2008, will use the European emergency number 112 and will be a unique communication hub for all types of emergency. Once operational it will process all the data and information relevant to emergency situations, including protection and rescue activities and measures. The Centre will be responsible for broadcasting the information to the public, State institutions, legal entities, rescue units and other competent bodies and subjects for protection and rescue (including the MIC).
- The Helicopter Unit. It operates three multi-purpose, medium, twin-engine helicopters and is responsible for search and rescue operations in the whole of Montenegro. The helicopters are also used for tactical transport of equipment and personnel in case of emergencies.

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168 Official Gazette of Republic of Montenegro no 13/2007.

169 Official Gazette of Republic of Montenegro no 5/2008.

170 Official Gazette of Republic of Montenegro no. 78/2004.

Table 3.20: Seismic risk in Montenegro. Area and population affected by seismic risk classified by the maximum expected intensity of earthquake<sup>171</sup>.

Region	Maximum intensity	area		Population	
		Km <sup>2</sup>	%	people	%
Coastal region	IX	1,900	13.8	151,000	24.4
Podgorica-Danilovgrad region	VIII	3,030	21.9	205,000	33.1
Central region of Montenegro	VII	7,600	55	229,000	36.9
Seismogenic zone of Berane	VIII	340	2.5	20,000	3.2
Northern region	VI	940	6.8	15,000	2.4

The Sector for Emergency Situations and Civil Security is currently engaged in the establishment of local Civil Protection units. They will be formed by volunteers and will constitute the main operational forces to be deployed in cases of emergency. A first contingent of 400 volunteers was expected to be deployed in the units by the end of 2008, with a further 1,600 volunteers joining the units by the end of 2009.

The Fire-Fighting Service is organised at local level through Municipal Rescue and Protection Units. Currently, 450 people are attached to these units.

In terms of exposure to natural hazards, Montenegro, in common with other countries along the Balkan coastline, is prone to very high seismic risk. According to data reported

by the National Strategy for Emergency Situations, almost 40 per cent of Montenegrin territory is at risk of an expected maximum seismic intensity greater or equal to magnitude 8 on the Richter scale. This affects some 60 per cent of the national population (National Census, 2003).

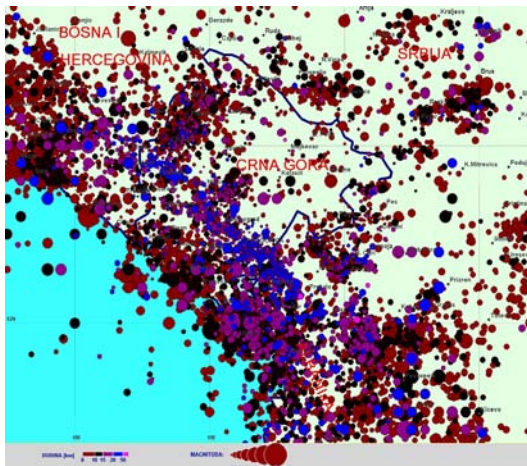
Montenegro is placed in the middle of an active seismic belt, frequently affected by catastrophic quakes. Figure 3.28, obtained from the National Strategy for Emergency Situations, shows the earthquakes that struck Montenegro from the fifteenth century to the present day (end of 2005).

Following a devastating earthquake in April 1979, which caused damage amounting to US\$4 billion and killed 136 people, the National Seismologic Institute of Montenegro, in cooperation with the Institute for Geological Research of Montenegro, the Institute for Earthquake Engineering and the Engineering Seismology Institute of Skopje (now in the FYR of Macedonia), constructed a first seismic zoning map of Montenegro. The map was completed in 1982 and used data observed by a network of telemetric seismologic stations. Such data, along with that provided by the pre-existing regional networks, was used to characterize the seismic activity and the structural composition of the earth's crust for the whole region.

From 1987 the seismologic institutes of the former SFRY prepared a series of seismologic maps, with reference to different recurrence periods, which facilitated the establishment of building codes relating to construction in seismic areas. The Regulations on Technical Norms for Building Construction in Seismic Areas<sup>173</sup> are still in force in Montenegro.

Figure 3.28

Earthquakes registered in the West Balkans area from the fifteenth century till the end of 2005. Each dot represents an event, with the size of the dot representing the earthquake's magnitude on the Richter scale, and its colour representing the (estimated) depth of the epicentre in kilometres<sup>172</sup>.



171 Courtesy of the National Strategy for Emergency Situations (2006).

172 Courtesy of the National Strategy for Emergency Situations (2006).

173 Official Gazette of SFRY no. 31/81 with amendments no. 49/82, 29/83, 21/88 and 52/90.

Table 3.21: Risk exposure and organisation in Montenegro.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with event	Level 2, 3	Level 2, 3	Level 3	Level 2, 3
degree of impact	high	high	high	high
<b>preparedness</b>				
prediction system	N/A	N/A	N/A	N/A
vulnerability maps	existing	existing	N/A	existing
<b>alerts and warnings</b>				
procedures	Level 2, 3	N/A	N/A	N/A
efficiency	good	N/A	N/A	N/A
public perception	N/A	N/A	N/A	N/A
<b>response and search and rescue</b>				
procedures	working from Level 2 to Level 3	locally designed	N/A	working at Level 2
efficiency	high	low	N/A	high
public perception	upper-medium	no	N/A	upper-medium

In parallel with the realization of seismic hazard maps, the Institute for Geological Research of Montenegro carried out a study from 1984 to 1988 on seismic micro-zoning for urban areas for all the municipalities of Montenegro.

A thorough analysis on seismic risk was conducted in 1984 by the Seismologic Institute, largely through research into the effects of the devastating earthquake of April 1979. The study identified risks and assessed vulnerabilities for an area comprising the main coastal municipalities and the municipality of Cetinje. However, to date this is the only study carried out in the field of risk characterization for Montenegro.

In this context, it is worth observing that the Sector for Emergency Situations of the Republic of Montenegro considers as a critical priority the enlargement of seismic risk assessments to cover the whole national territory, especially for the most populated municipalities located in high-risk zones such as Budva, Herceg Novi, Bar, Ulcinj and Podgorica.

Other natural hazards include flash floods, landslides and rock falls, which often follow heavy rain and can

have a critical impact on Montenegrin territory. The country's complex topography makes such events frequent and potentially very damaging for settlements and public infrastructure, especially the 7,000 km road network, much of which is located in mountain areas.

Forest fires are even more frequent and widespread, especially in the rural coastline areas and in the central region. Often fires are started through agricultural practices.

As well as natural hazards, Montenegro's ageing industrial facilities and transport infrastructure present major challenges for Civil Protection and represent a significant risk to the population. In January 2006 a train crash killed 45 people, highlighting the intrinsic problems with the railway system. Major hazards include oil storage facilities on the coastline, and mines and steel factories in the central region.

The National Strategy for Emergency Situations contains an analysis of the potential consequences of a major incident.

### 3.7.3 Human resources and costs

The Sector for Emergency Situations and Civil Security has a staff of 123 civil servants.

There were 400 volunteers expected to have joined the municipal Civil Protection units by the end of 2008, with a further 1,200 expected to join by the end of 2009.

Municipal fire-fighting units include 450 personnel.

### 3.7.4 Civil Protection and society

The Sector for Emergency Situations and Civil Security prepares specific training plans for personnel involved in Civil Protection activities, for operational units, and the public.

Worthy of note is a training course for seismic hazards, organised with the support of the French Sécurité Civile, and a seminar on chemical, biological, radiological, and nuclear hazards (CBRN) prepared with the support of the Danish Emergency Management Agency (DEMA).

Table 3.22: Human resources involved in Civil Protection in Montenegro.

HUMAN RESOURCES				
Level 2 and Level 3				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	123 <sup>(A)</sup> + 450 <sup>(B)</sup>	123 <sup>(A)</sup> + 450 <sup>(B)</sup>	-	123 <sup>(A)</sup> + 450 <sup>(B)</sup> + 400 <sup>(C)</sup>
% of the national active population	0.13	0.13	-	0.23

Notes to Table 3.22:

(A) Permanent staff belonging to the Sector for Emergency Situations and Civil Security;

(B) Members of Municipal Rescue and Protection Units (municipal fire-fighter units);

(C) Volunteers enrolled in Civil Protection units (end of 2008).

Table 3.23: Average annual costs of the Civil Protection system in Montenegro.

ANNUAL COSTS					
Level 2 and Level 3					
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	cost of equipment, technology and emergency assets	Annual average cost of post-emergency recovery	overall cost of Civil Protection
euros (millions)	no information available	no information available	no information available	no information available	no information available
% of the national GDP	-	-	-	-	-
research and development					
	investment for university departments, research agencies and/or organisations working for Civil Protection	maintenance for university departments, research agencies and/or organisations working for Civil Protection	public or private companies supplying hardware and software		
euros (millions)	no information available	no information available	no information available		

In terms of cross-border activities, Montenegro has signed bilateral agreements with Croatia and with Bosnia and Herzegovina. The agreements define a common protocol for mutual cross-border cooperation in the event of disasters caused by natural hazards or industrial incidents.

Further agreements are currently under discussion with Serbia, the FYR of Macedonia, Albania, and Slovenia, while specific memorandums of understanding in the fields of education, technical training, preparedness and prevention are being considered with Turkey and Italy.

## 3.8 Romania

### *Public perception of Civil Protection*

Civil Protection is viewed in Romania both in terms of the traditional concept of ‘protection and rescue’ and the broader notion, prevalent in the EU, that each citizen has the right to safety at home, at work and while travelling around the country.

The Government of Romania is responsible for protecting people and assets in emergency situations and for the organising of population preparedness and Civil Protection forces in order to conduct operations in the event of crises.

The Law on Civil Protection states that the citizens of the Republic of Romania, foreign nationals and stateless people residing in the territory of the Republic have, in emergency situations, the right to protection of life and health through material and financial assistance donated either individually or collectively.

Moreover, each citizen has the right, as well as an obligation, to be trained in protection and rescue and to receive full and timely information about all threats of disaster, as well as all available protection measures and activities.

### *Demography and administration*

The population of Romania is almost 22.2 million people, giving it an order of magnitude of *Level 0* according to the classification used in this report<sup>174</sup>.

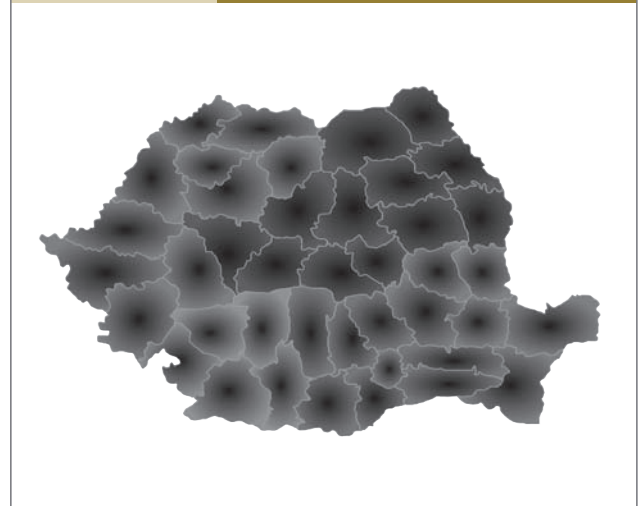
Romania is divided into 41 counties (regions) and the municipality of Bucharest, which has a population of just over 2 million and is its own administrative unit. Each county is administered by a county council, responsible for local affairs, as well as a prefect appointed by central Government. The prefect, who can have no political affiliation, is the chairperson of the county committee for emergency situations (*Level 1*).

The country is further subdivided into 319 cities and 2,686 communes, which are in rural localities. Each of the

*Level 2* entities has its own local council and is headed by a mayor. Some 103 of the larger cities have the status of municipalities, which gives them greater administrative power over local affairs. Each municipality has a local committee for emergency situations, with the mayor as chairperson.

Figure 3.29

Administrative divisions of Romania: 41 counties<sup>175</sup>.



### 3.8.1 Legislation

The national policy addressing disaster prevention and management is articulated through various legislative documents and through the work of different administrative authorities, public institutions and specialist bodies with responsibilities for disaster prevention and response management.

The relevant laws regarding the national policy for disaster management are:

- G.O. no. 2288/09.12.2004, regarding the repartition of main tasks in the event of emergency situations for ministries, central public authorities and NGOs;
- G.O. no.1489/09.09.2004, regarding principles underlying the organisation, functioning and task management of the professional emergency services;
- G.O. 1491/28.09.2004, regarding regulations covering the organisation, functioning, task management and endowment of operative committees and emergency situation centres;

<sup>174</sup> The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to *Level 0* when dealing with organisations responsible for populations of 10 million to 100 million; to *Level 1* when dealing with organisations responsible for populations of 1 million to 10 million; to *Level 2* when dealing with organisations responsible for populations of 100,000 to 1 million; and to *Level 3* when dealing with organisations responsible for populations of 10,000 to 100,000.

<sup>175</sup> Courtesy of en.wikipedia.

- G.O. no. 88/2001, concerning the organisation and functioning of emergency situation public services, approved by Law no. 363/2002;
- Law no. 307/12.07.2006, concerning protection against fire;
- Civil Protection Law no. 481/08.11.2004;
- G.O. no. 1490/09.09.2004, regarding regulations on the organisation and functioning of the General Inspectorate for Emergency Situations;
- G.O. no. 1492/2004, regarding regulations on the organisation, functioning and attributes of professional emergency services.

During the last few years, the emergency situation management system has been reorganised and the responsibilities of *Level 0*, *Level 1* and *Level 2* institutions involved in this field have been redefined. Current legislation has created new institutions and operational structures to deliver coordinated and professional protection to the public, infrastructure and environment during emergency situations.

Emergency Ordinance no.21/2004 established the National Management System for Emergency Situations, which acts as reference body for *Level 0* disasters. It is composed of:

- emergency situations committees;
- General Inspectorate for Emergency Situations;
- professional emergency services;
- operative centres for emergency situations;
- action commander.

The emergency situations committees include:

- National Committee for Emergency Situations (*Level 0*);
- committees for emergency situations of ministries and other central public institutions;
- Bucharest municipal committee for emergency situations;
- county committees (*Level 1*) for emergency situations;
- local committees (*Level 2*) for emergency situations.

The declaration of an emergency situation represents an exceptional act which allows the application of a series of political, economic and public order measures covering the entire territory (*Level 0*), or parts of the territory (*Level 1* or *Level 2*). Emergency status can be declared

when there exists a serious actual threat or imminent threat to national security or the functioning of democracy; or there exists an actual calamity or imminent threat of calamity which requires prevention or mitigation activities.

During an emergency situation, intervention activities are managed by the National Committee for Emergency Situations, which is under the Ministry of Administration and Interior and the coordination of the Prime Minister.

The National Committee for Emergency Situations sets up, organises and aims at the prevention and management of emergency situations and the provision and coordination of human, material and financial resources. The system is an integrated framework within which all the support tasks for prevention and management of emergencies are shared among national ministries, central bodies and NGOs.

Disaster risk reduction activities relating to floods, meteorological phenomena and accidents involving hydraulic facilities are directed by the National Policy and Medium- and Long-Term Flood Risk Management Strategy, which was elaborated by the Ministry of Environment. The main activities include:

- Management of water catchments;
- Construction of reservoirs, polders, river dams, and watercourse regularization correlated with conservation of biodiversity through maintenance of humid areas;
- Water-course management and versant (sloping land) forestation;
- Tackling soil erosion and excessive drainage;
- Encouraging civic responsibility regarding the improvement of water purity;
- Upgrading the information network to facilitate the efficient issuing of public warnings.

The National Policy and Medium- and Long-Term Flood Risk Management Strategy takes account of a number of issues impacting water management, including changes in weather patterns, the implementation of EU policies, the growth in public authorities' role in river rehabilitation and public involvement in decision-making.

With regard to earthquakes and landslides, the main risk reduction objectives are:

- Completion of the legislative and organisational frameworks in order to mitigate the consequences of earthquakes and increase building integrity;



- Improvement of existing legal framework and technical tools, including software, equipment and manuals, to enhance technical expertise and facilitate project development and building consolidation;
- Establishing the technical and organisational conditions needed for the collection, collation and automatic processing of information regarding structures with high seismic risk;
- Diversification of resources and financing to continue the consolidation of dwellings through resilient design and retrofitting;
- Improvements to earthquake insurance scheme;
- Improvement of disaster management, particularly in the case of earthquakes, taking into account the main aspects of prevention, protection and intervention, as well as public education.

In order to achieve the proposed objectives, several national programmes have been established and are ongoing in cooperation with international institutions<sup>176</sup>.

Emergency Ordinance 21/15.04.2004 established that the national authority responsible for multi-sectoral coordination is the National Committee for Emergency Situations, through the General Inspectorate for Emergency Situations. The National Committee is managed by the Minister of Administration and Interior, under the coordination of the Prime Minister. It is an inter-ministerial body, comprising decision makers and experts in the management of *Level 0* emergency situations.

The General Inspectorate for Emergency Situations was set up at the end of 2004 to better coordinate activities. It was established through the merging of

the Civil Protection Command and the General Inspectorate of Military Fire-fighters, of the Ministry of Administration and Interior. As a specialist body, its aim is to ensure the coordination of prevention activities and the management of emergency situations. The General Inspectorate includes a specific department dealing with prevention, a national operations centre and other structures needed to manage emergency situations.

The national operations centre facilitates the work of the Standing Technical Secretariat of the National Committee for Emergency Situations, which is responsible for cooperation at national level in Civil Protection and emergency situations management<sup>177</sup>.

### 3.8.2 Civil Protection structure

The Romanian emergency management system comprises a network of authorities, organisations and other bodies with particular competences in emergency situations management. The network includes emergency situations committees, the General Inspectorate for Emergency Situations, professional services, operational centres for emergency situations and action commanders. The system is coordinated by public authorities using available resources to fulfil their responsibilities. Its structure is shown in Figure 3.30.

The emergency situations committees operate on three different levels, *Level 0*, *Level 1* and *Level 2*. At *Level 0* are the National Committee for Emergency Situations, various ministerial committees and those of other public authorities operational during emergency situations. At *Level 1* are the county committees for emergency situations, while at *Level 2* are the local committees for emergency situations.

The National Committee for Emergency Situations is under the direct leadership of the Ministry of

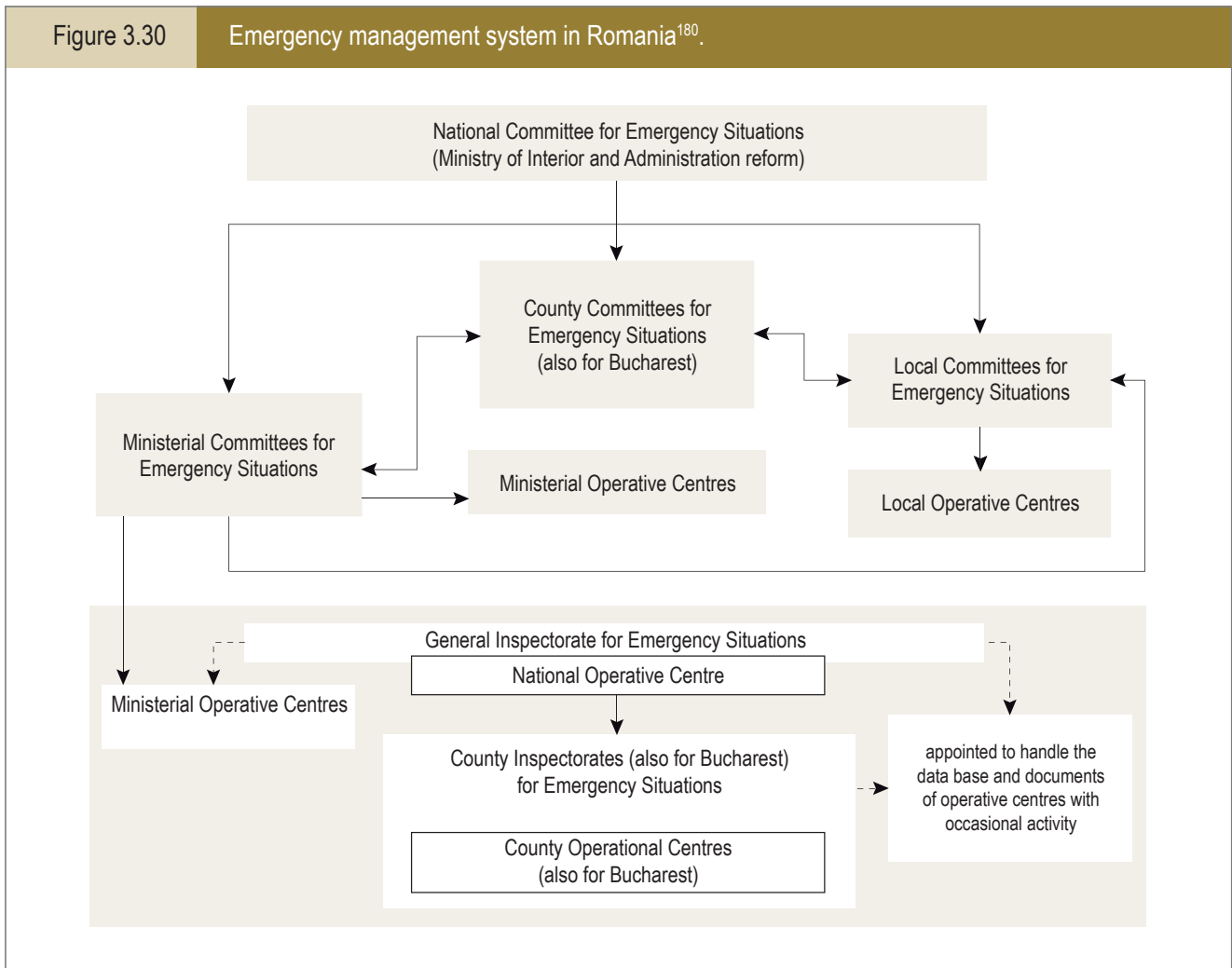
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176 Programmes include: The National annual programmes for design and consolidation of tall dwellings, technically assessed and included in the category of first-class seismological risk which represent a public danger; Programme to improve safety for hospitals in case of earthquakes; Programme to improve safety for school buildings in case of earthquakes; Programme regarding the development and upgrading of seismological networks in Romania; Programme to improve safety for buildings of category one importance which must be completely functional during and after an earthquake; The enlargement of international cooperation in the field of earthquake prevention; Programmes for surveillance of natural disasters which occur on Romanian territory, using Geographical Information Systems – GIS; Programme regarding earthquake prevention, protection and relief management; Action programme regarding the construction of emergency buildings to relocate the victims of a major earthquake; Programmes to elaborate/update the territory management plans at county, regional and national level, taking into account the new legal regulations for building and transportation; Programmes for urgent completion of unfinished buildings, including those needed for temporary shelter of relocated residents, which have to be consolidated.

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177 The main attributes of the General Inspectorate for Emergency Situations are as follows: Assess, evaluate and monitor risks, make predictions regarding those risks in order to identify the potential emergency situations, and make decisions to prevent emergency situations and to warn the public; Ensure the unitary co-ordination of prevention actions and management of emergency situations covering the whole territory; Co-ordinate the national development programmes in the field of defence against disasters; Use the media to inform the public regarding the imminence of emergency situations and the actions that must be taken to limit and reduce their effects; Ensure the technical and specialized co-ordination of operational and operative centres, and maintain their permanent information flow; Co-operate with international bodies, as part of international conventions and agreements; Co-ordinate, at national level, the resources needed in emergency situation management and elaborate the plan with human, material and financial resources for these situations; Provide technical specialized assistance to local and central authorities in emergency situations management.

Figure 3.30 Emergency management system in Romania<sup>180</sup>.



Administration and Interior and is coordinated by the Prime Minister. It is an inter-ministerial organisation composed of decision-makers and experts from authorities with responsibilities in emergency situations. Its functioning and structure are defined by G.O. 1489/2004.

The National Committee for Emergency Situations has a complex composition<sup>178</sup> and various attributes<sup>179</sup>. It is responsible for the coordination of management in

the event of an emergency situation in more than two counties, the coordination of any disaster mitigation activities of international forces, and for disseminating information to the public regarding emergency situations management.

Ministerial committees for emergency situations operate at *Level 0* and are composed of decision makers and experts from ministries and other institutions, and representatives from other ministries and institutions. County committees, responsible for managing emergency situations at *Level 1*, are headed by prefects<sup>181</sup>. Local committees for emergency situations

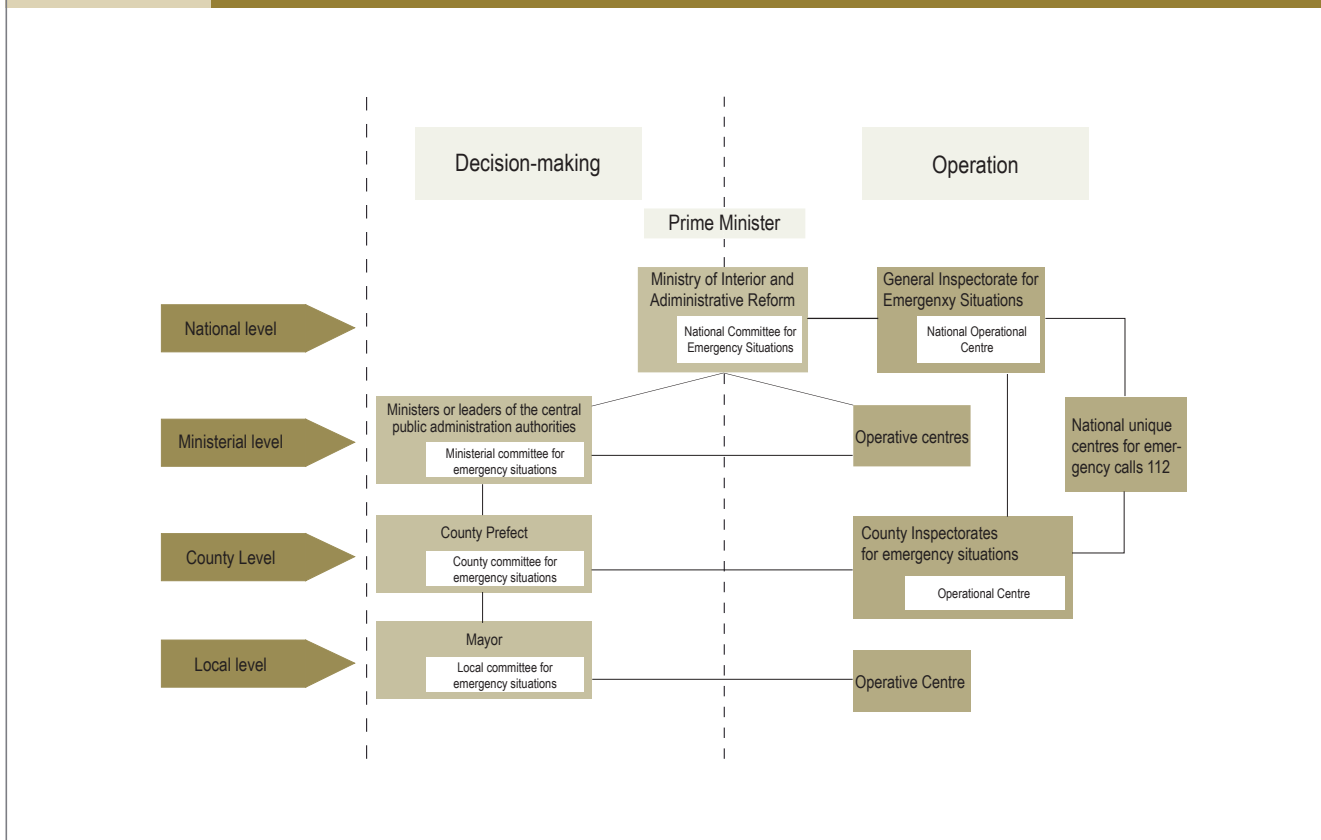
178 Its structure is as follows: President: Ministry of Administration and Interior; Vice-President: State secretary from the Ministry of Administration and Interior; members: State secretary from each ministry or a deputy leader from every central public institution and the General Inspector of the General Inspectorate for Emergency Situations; consultants: 1-2 experts from each ministry and central public institution.

179 Its attributes include: Initiating legislation regarding emergency situations management and approving ministerial and county committees' legal papers; Examining and proposing for Government approval the national plan for human, material and financial resources in order to manage emergency situations; Subsequent to Prime-Ministerial approval, declare the setting-up/cessation of 'warning status' at national level or at the level of several counties; decide the application of an evacuation plan under the proposal of ministerial or county committee.

180 Courtesy of the Romanian General Inspectorate for Emergency Situations.

181 The county committees are formed by the county council president, managers of public institutions and private companies and the leaders of private companies which present potential risks and can generate emergency situations. The organisation, attributes and functioning of county committees are established by orders of the prefect.

Figure 3.31 Information flow in the Romanian National Management System for Emergency Situations<sup>183</sup>.



operate at *Level 2* and are convened at city, commune or village level under the leadership of mayors<sup>182</sup>.

Figure 3.31 shows the flow of information in the National Management System for Emergency Situations.

The General Inspectorate for Emergency Situations has a key role in the Civil Protection structures of Romania and is responsible for the coordination of all organisations involved in emergency situations management. As well as the management of emergency situations, the Inspectorate implements risk reduction legislation applying to the protection of life, assets and the environment. Moreover, it organises the work of the Standing Technical Secretariat of the National Committee for Emergency Situations, and coordinates the activities of institutes participating in emergency

182 The members of local committees include: one vice-major, local secretary, and representatives from public institutions and companies in that territory. The mayor, with the agreement of the prefect, organises and establishes the attributes and functions of the local committee.

183 Courtesy of the Romanian General Inspectorate for Emergency Situations.

management according to the international principles of bodies including UNO, NATO and the EU. The Inspectorate coordinates disaster risk reduction activities in times of peace and of war.<sup>184</sup>

In terms of exposure to natural hazards, Romania is highly vulnerable to earthquakes and floods. The country is one of the most seismically active countries in Europe.

In accordance with the Plan for National Territorial Arrangement, Romania has developed risk maps for hazards including floods, landslides and earthquakes for every locality considered to be at risk from natural hazards. These maps are to be used in order to implement specific measures for building use and land management. They are already used in the sectors of energy, transport and construction, as well as by other private companies, and are available to the public.

184 Responses in emergency situations include: the rescue of people; public evacuation; fire-fighting; mitigation of the environmental consequences of accidents (including chemical, radiological and biological accidents) occurring during transport of dangerous substances.

A national report regarding disaster management in Romania was developed in 2001. This complex document assessed the impact, intensity and evolution of the main types of hazards affecting Romania, and identified the country's vulnerabilities. It examined the human, material and financial resources available for hazard management and assessed which buildings and which elements of infrastructure, including roads and bridges, were vulnerable to potential disasters.

The report also analysed the governmental and non-governmental structures involved in disaster management and international cooperation in disaster situations, as well as the capacities and challenges in disaster prevention, preparedness and management both at national and regional level. Any gaps or imperative needs were identified.

The information provided by Romania through the national report, which was transmitted to the South-East Europe Stability Pact, contributed to the development of the 'Gorizia' Regional Report.

During the drafting of the report, assessments regarding the country's level of vulnerability to flooding were also made. Specialist institutes, such as the Geographical Institute of the Romanian Academy, the National Institute for Building Research and the National Institute for Earth Physics, established vulnerability levels, taking into account the frequency of floods, existing hydrological networks and topography, as well as social, economic, cultural and environmental factors.

An emergency alert status is declared by the National Committee for Emergency Situations, following approval by the Prime Minister and in accordance with Emergency Ordinance no.21/2004. The declaration prompts the fast application of action plans including the issuing of warnings, prevention measures and mitigation activities to manage the emergency situation. Following their activation, the operational centres, under relevant *Level 0* or *Level 1* emergency committees, are responsible for delivering timely and efficient flow of information. The public is generally well informed of the specific rules and modes of behaviour in the event of alerts, an awareness that is re-enforced through periodic exercises and through real disaster situations.

Some capacity gaps were observed, especially in the more isolated regions of the country, regarding the

effectiveness of transmissions of alerts and warnings, and in terms of the familiarity of the population with risk reduction activities.

In terms of exposure to natural hazards, Romania is included in the Mediterranean seismic region, part of the south European alpine belt. The country is situated on four tectonic microplates that converge in the curvature of the Carpathians. It is affected by earthquakes of varying magnitudes and return periods.

There are some early reports of earthquakes in the fourteenth and fifteenth centuries that document their disastrous effects. Reports from the nineteenth century discuss three earthquakes, in 1802, 1838 and 1894, with epicentres in the Vrancea region. In the twentieth century two violent earthquakes struck Romania causing tremendous human and material losses. The epicentres of both were again situated in the Vrancea region. The second earthquake, in March 1977, is considered one of the most violent seismic events on the continent during the previous century, with a magnitude of 7.2 on the Richter scale and a hypocentre 110km deep. It killed 1,570 people, injured 11,300 and destroyed or damaged 32,900 buildings.

Such violent, high-magnitude earthquakes like those of the Vrancea zone have longer return periods of between 35 and 45 years, which is the time it takes for significant tensions to accumulate in the tectonic plates. Other seismic zones, such as those situated in Banat, in the north-west of Romania, and in the Făgăras mountains, in the Meridional Carpathians, typically are affected by earthquakes of smaller magnitudes.

Following the devastating earthquake of 1977, a new seismic zonation of Romanian territory was elaborated. It used parameters including geological structure and plate tectonics, intensity of previous earthquakes and return periods.

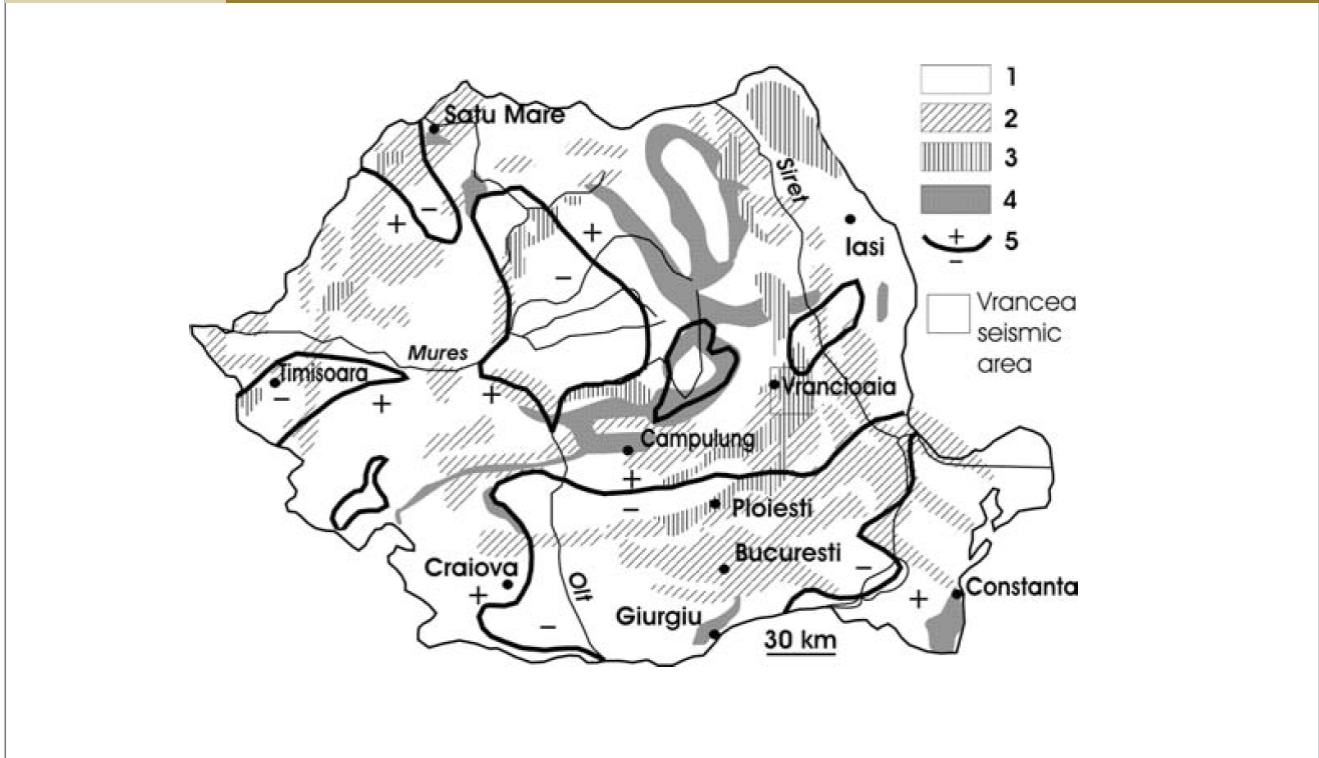
A real-time seismic surveillance warning system, developed in cooperation with partners from Russia and Italy, has been in operation since 2000. The system is part of a NATO Science for Peace (SfP<sup>185</sup>) project (no. 972266) for the seismic zone of Vrancea.

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<sup>185</sup> NATO's SfP oversees a programme which contributes to link science and society through projects conducted under well-established procedures. It focuses on security, environmental sustainability and other defined priorities of its Partner nations.

Figure 3.32

Seismic hazard map of Romania: 1) areas free of seismic hazard; 2) areas with low seismic hazard; 3) areas with high (local and general) seismic hazard; 4) neo-tectonic movements; 5) main faults (courtesy of Armas, 2006).



The new seismic zonation facilitated further improvements to the design of buildings to enhance their integrity in the event of earthquakes. The design of civilian, industrial and agricultural buildings have all benefitted from the introduction of new codes<sup>186</sup>.

Concern over the vulnerability of buildings to earthquake damage and the desire to improve seismic resilience were triggered primarily by the impact of the powerful 1940 earthquake. It led to the introduction in 1943 of the first regulations regarding resilient design, which were introduced by the Ministry of Public Works. This was followed in 1950 by the systematic consideration of lateral forces in the design of buildings, but it was only in 1963 that the first seismic design code was endorsed, with new editions following in 1970, 1978, 1981, 1991 and 1992.

186 Norms P100/91 for anti-earthquake design of residential, social, cultural, industrial, agricultural and animal-related buildings, chapters 11 and 12, republished in the Buildings Bulletin no. 11/1996; The new Code no. P-100-1/2004 will be harmonized with Eurocode 8; Law no. 10/1995 regarding the quality of construction, together with additional regulations, approved by Governmental Decision no. 766/1997, with subsequent modifications and enlargements.

A significant development followed in 1991 with the introduction of the new P100 seismic codes, which were revised in 1992 and 1997. They introduced the obligation to evaluate and, if required, rehabilitate existing buildings according to a set of criteria, with some public financing. This policy led to important technical, social, legal and financial demands, whose consequences proved the difficulty of this necessary approach. In order to improve the legal backing on this issue, a Government Ordinance on Strengthening of Existing Buildings (Ordinance no. 20/ 1994) was adopted<sup>187</sup>.

The main legal gain of the ordinance was the statement concerning the ‘national interest’ represented by the activities related to the safety of the existing building stock. It led to a set of duties for the Ministry of Transport, Constructions and Tourism and other departments as well as duties for public and private owners of buildings. Evaluations of the resilience of residential buildings are provided for free, while for design and strengthening work the owner may receive

187 G.O. no. 20/1994 was modified and republished in the Official Journal, December 2007.

Figure 3.33

Regional meteorological centres operating under the National Meteorological Administration<sup>188</sup>.



a bank credit at 5 per cent interest up to 20 years. Owners of apartments in the highest category of risk, who have incomes below the national average, may receive full subsidies. Thousands of evaluation reports and preliminary strengthening projects have already been drafted, but the works are costly and delayed because owners are still reluctant to apply for loans under the clauses requiring the mortgaging of their properties until the repayment of debts.

As well as earthquakes, floods represent a significant risk on Romanian territory. Floods are primarily generated by rainfall from May to November, by the melting of snow, or by the superposition of the two events during the winter-spring period. They can be widespread and their effects can be catastrophic.

In 1965, as a consequence of exceptionally high precipitation, intense floods were registered on the majority of rivers in Romania. In 1970 intense rainfall caused devastating floods on the main rivers in Transylvania; 1,500 localities were affected and 85,000 houses were flooded, 45,000 of which were destroyed or severely damaged. A national hydrometeorological informational system

has been established to provide early warnings in case of floods and other dangerous meteorological phenomena, working round-the-clock. The first hydrometeorological warnings were issued in March 2004. The bodies involved in this system are the National Hydrological Institute and National Meteorological Administration, the Romanian Waters National Administration, local and county commissions for defence against disasters, and county inspectorates for emergency situations.

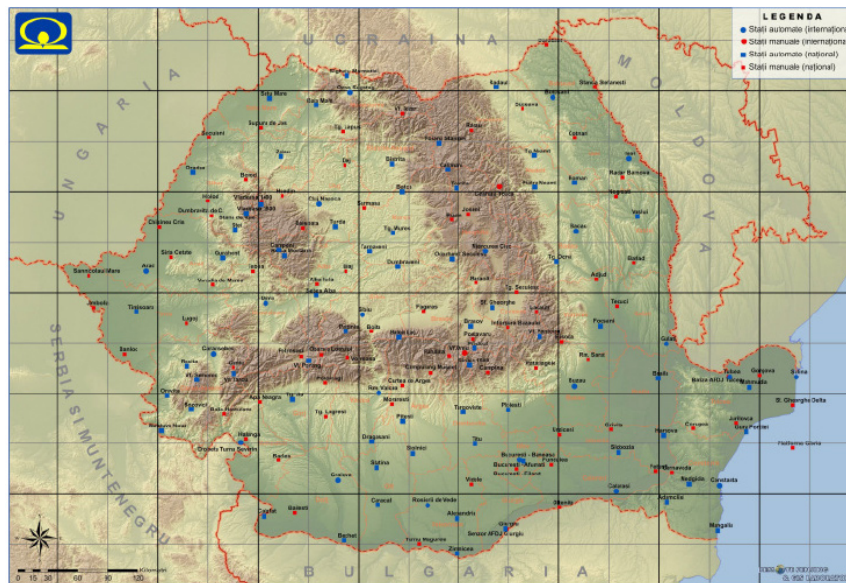
Efficient flow of information ensures a permanent connection with the system's target objectives. A typical information chain could consist of alerts and warnings from the National Hydrological Institute being transmitted to the General Inspectorate for Emergency Situations (*Level 0*).

The General Inspectorate then transmits this information to the county inspectorates for emergency situations (*Level 1*), which are responsible for informing the localities (*Level 2*) to the levels of police stations. To ensure potentially vital information reaches its intended destinations, the same alerts and warnings

188 Courtesy of the Romanian National Meteorological Administration.

Figure 3.34

Network of weather stations operating under the National Meteorological Administration (2007)<sup>189</sup>.



are transmitted via a second route, through prefectures and local authorities.

The substantial reduction in human and material losses during the most recent floods are considered testament to the system's efficiency.

An important component of the early warning system is the provision of observation data from a network of upper-air stations, radars and sources on the ground. The meteorological network is coordinated by the National Meteorological Administration through seven meteorological centres (Figure 3.33), with a total of 160 ground weather stations (Figure 3.34) and 9 Doppler radars (Figure 3.35) in operation at the present time.

In terms of technological hazards, the major risks in Romania are associated with nuclear plants and chemical plants, as presented in Figure 3.36 and Figure 3.37.

The Ministry of Environment and Waters Management has established legal methodologies for evaluating vulnerabilities caused by the impact of industrial and other economic activities. The

methodologies are used as the basis for compulsory studies carried out by all economic agents and are developed by institutes and firms authorized by the Ministry of Environment and Waters Administration.

189 Courtesy of the Romanian National Meteorological Administration.

Figure 3.35

Doppler radar network operating under the National Meteorological Administration (2007): 4 C-Band and 5 S-Band radars<sup>190</sup>.

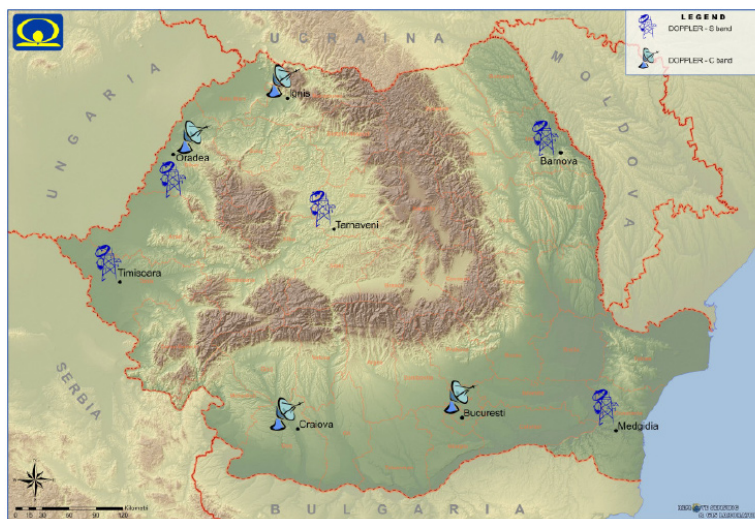


Table3.24: Risk exposure and organisation in Romania.

NATURAL HAZARDS	floods, flash floods	earthquakes
level dealing with event	Level 0	Level 0
degree of impact	high	high
<b>preparedness</b>		
prediction system	yes	not applicable
vulnerability maps	yes	existing
<b>alerts and warnings</b>		
procedures	working at level 0 and level 1	not applicable
efficiency	high	not applicable
public perception	high	not applicable
<b>response and search and rescue</b>		
procedures	working from Level 1 to Level 2	working at Level 1
efficiency	high	high
public perception	high	high

<sup>190</sup> Courtesy of the Romanian National Meteorological Administration.



Figure 3.36

Nuclear risk areas in Romania<sup>191</sup>.

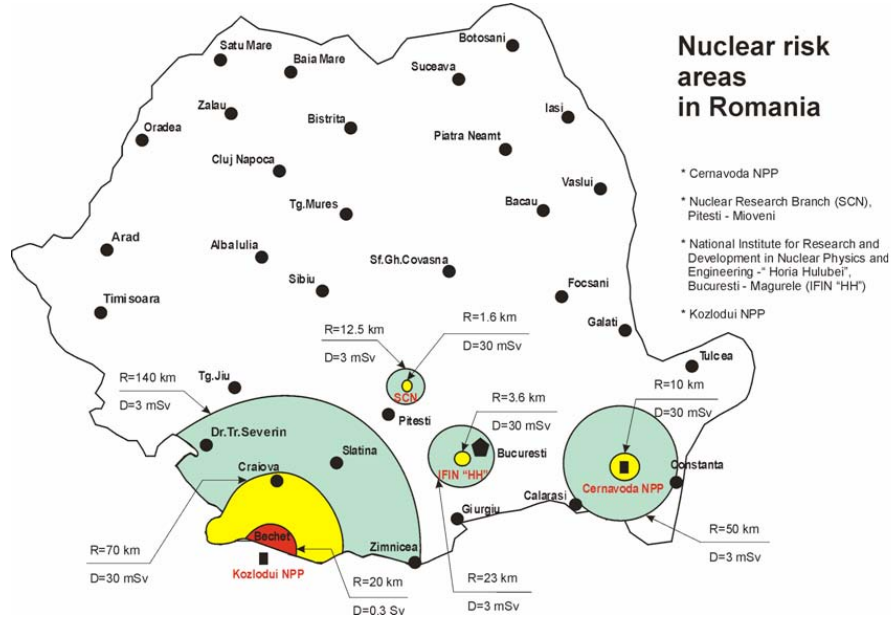


Figure 3.37

Nuclear risk areas in Romania<sup>192</sup>.



191 Courtesy of the Romanian General Inspectorate for Emergency Situations.

192 Courtesy of the Romanian General Inspectorate for Emergency Situations.

The vulnerabilities of industrial facilities are evaluated through consideration of qualitative (HAZOP) and quantitative (HAZAN) factors. The results form the basis of a vulnerability framework consisting of various categories of risk. The framework is eventually used to determine the application of risk reduction measures.

Two of the evaluation methodologies used by the Ministry were finalized through projects co-financed and co-developed with the Italian Ministry of Environment, Land and Sea. They were the EHRA project, concerning impact on water, and the ongoing TEIAMM project, concerning impact on air.

All methodologies and studies are based on ISO quality and efficiency standards and are in accordance with European norms.

### **3.8.3 Human resources and costs**

One of the main duties of the National Committee for Emergency Situations, in accordance with Emergency Ordinance no.21/15.04.2004, is to examine and propose to the Government for approval the National Plan for Assurance of Human, Material and Financial Resources for Emergency Situation Management, elaborated by the General Inspectorate for Emergency Situations.

Furthermore, it is responsible for proposing to the Government the allocation of funds from the State budget necessary for emergency situations management.

In accordance with Public Financial Law no.500/2002, the State budget includes provision for the Government's Intervention Fund, which is used to finance disaster mitigation activities and support for individuals suffering the consequences of calamities. Local and county councils are responsible for making provisions for relevant disaster prevention and mitigation activities from their own budgets.

In exceptional cases, such as states of emergency, there is legal provision for the requisition of technical and material resources to supply intervention forces.

The Ministry of Environment and Waters Management funds new flood-defence projects, as well as reconstruction of structures damaged by previous floods, from its annual budget.

The Ministry of Regional Development and Housing funds retrofitting work to improve structural integrity of multi-storey inhabited buildings which have been classified as seismic risk category one and represent a danger to the public. Between 2001 and 2003 about €2.4 million was spent on improving the structural resilience of buildings to seismic events. This funding represents a transfer of money from State to local budgets, and in 2004 amounted to approximately €1 million.

Ministries, central public authorities and local authorities are legally obliged to provide funding for disaster prevention and mitigation activities. Financial resources are assigned from a special governmental intervention budget, at *Level 0*, and from regional budgets, at *Level 1*.

In the event of a disaster, the central-level National Administration for State Reserves is responsible for managing allocation of materials to support people affected, according to Government decisions.

At county level (*Level 1*), Civil Protection inspectorates maintain warehouses with necessary first-response materials and other protection and intervention resources to support displaced populations. The warehouses are maintained through county budgets.

Five warehouses under the management of the General Inspectorate for Emergency Situations are currently being modernized to ensure their operational efficiency in the event of disaster. Other resources include warehouses belonging to the National Red Cross Society, which contain emergency shelters, clothes, footwear and food.

### **3.8.4 Civil Protection and society**

There are many collaborative initiatives between the academic community and national and local research institutions involved in disasters prevention. This collaboration is manifest through various training exercises, seminars, conferences and congresses as well as through joint research programmes.

In order to establish and fulfil structural and non-structural measures for defence against floods a permanent collaboration between the Central Commission for Defence against Floods, Dangerous Weather Events and Dams Accidents and specialist institutes developing studies and research in this field has been put into action. Such collaborations are mainly with the National Hydrological

Table 3.25: Human resources involved in Civil Protection in Romania.

HUMAN RESOURCES				
Level 1				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	1,200 <sup>(A)</sup>	no information available	no information available	1,200 <sup>(A)</sup> + 142,000 <sup>(B)</sup> + 21,175 <sup>(C)</sup>
% of the national active population	0.008	-	-	1.1
Level 2				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	no information available	no information available	no information available	no information available
% of the national active population	-	-	-	-

Notes to Table 3.25:

(A) General Inspectorate for Emergency Situations.

(B) Organised volunteers. Most are organised into detachments around the country.

(C) Personnel from private enterprises.

Table 3.26: Average annual costs of the Civil Protection system in Romania.

ANNUAL COSTS							
Level 1							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of Fire Brigade due to activities during 'emergency periods'	percentage cost of Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	24	no information available	no information available	no information available	no information available	no information available	24
% of the national GDP	0.013	no information available	no information available	no information available	no information available	no information available	0.013
Level 2							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	operational cost of equipment, technologies and emergency assets		average annual cost of post-emergency recovery	total funding for Civil Protection	
euros (millions)	no information available	no information available	no information available		no information available	no information available	
% of the national GDP	no information available	no information available	no information available		no information available	no information available	
research and development							
	investment for university departments, research agencies and/or organisations working for Civil Protection		maintenance for university departments, research agencies and/or organisations working for Civil Protection		public or private companies supplying hardware and software		
euros (millions)	no information available		no information available		no information available		

Institute, the National Meteorology Administration and AQUAPROIECT. The institutes have established a range of useful tools for risk reduction, including risk maps, flow-charts for flood defence mechanisms and other hydrographical models.

In the field of mitigating seismological risk, particular attention deserves to be paid to the establishment of the Collaborative Research Centre (CRC) 461<sup>193</sup>. This German-Romanian joint initiative, launched in 1996 and ending in December 2007, studied the complex field of strong earthquakes focusing on the Vrancea events in Romania. The project was developed through international collaboration between the National Institute for Research and Development for Earth Physics, the National Institute for Building Research and Karlsruhe University of Germany.

Under the coordination of the Ministry for Transportation, Constructions and Tourism, studies have been elaborated to contribute to the improvement of a normative base for designing and monitoring construction projects. Also, the Central Commission for Prevention and Defence against Seismic Effects and Landslides, within the Project for Romanian-Japanese Technical Cooperation for Mitigation of Seismic Risk of Buildings and Structures, and the National Centre for Mitigation of Seismic Risk organised during 2003-2004 a series of technical seminars on the 'fast inspection' of reinforced concrete buildings damaged by earthquakes. These seminars were attended by experts from universities and specialist research and design institutes, as well as from central and local public administrations, Civil Protection inspectorates and inspectorates for construction at central and territorial level.

A great deal of valuable experience on assessment, repair and strengthening of buildings and other structures was accumulated after the earthquakes of 1977, 1986 and 1990. The systematic approaches devoted to reducing the seismic risk have represented a target for education and training activities since 1977.

The professional associations for earthquake and civil engineering have contributed to these efforts with symposia, conferences and publications. The large number of highly experienced civil engineering design institutes have developed and promoted new structural

systems which have enhanced building integrity. The large-panel designs which were developed for buildings in seismic zones of between five and nine storeys are a case in point.

In order to improve the management of disasters caused by technological hazards, as well as associated disasters caused by natural hazards, the General Inspectorate for Emergency Situations is collaborating with the Polytechnic University of Bucharest and University Babes-Bolyai of Cluj-Napoca.

Of all the collaborations entered into by the General Inspectorate, those with the Romanian Academy have been especially constructive thanks to the contributions made by its members to the National Committee for Natural Hazards and the National Committee for Environmental Weather Changes.

Projects of note include the development of an information exchange system using data received from an environmental surveillance system to facilitate the control of atmospheric pollution in mountainous areas. The project was a collaboration between the Romanian Academy and the Japanese National Committee of the International Geographical Union and Japanese Hosei, Nihon and Mie Universities.

A research and development core programme called TESIS (Advanced Technologies and Systems for the Knowledge-based Information Society), financed by the Ministry of Education, Research and Innovation, includes a project to develop a system for public awareness and education concerning disasters as part of an objective to develop new technologies, platforms and services for 'e-Government'.

This project has been developed by experts in software tools for education, economics and environment at the National Institute for Research and Development in Informatics, in cooperation with specialists from the General Inspectorate for Emergency Situations and the Geography Institute.

The Romanian Academy's institutes for scientific research: the Institute for Geography, Institute for Geology and Institute of Geodynamics, along with specialist institutions, participate in projects to assess and evaluate special hazards on Romanian territory and identify the most efficient response procedures.

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193 For further information on CRC 461 see:  
<http://www-sfb461.ipf.uni-karlsruhe.de/>

It should be noted that special attention is paid to the use of training programmes in schools to encourage an awareness of risk and risk reduction concepts. Analytical training programmes and special materials have been developed by commissions on every type of disaster to build a culture of safety<sup>194</sup>. As part of the programmes, theoretical and practical activities regarding behaviour in case of disasters are organised, including competitions for students. The importance of training teachers in risk reduction and recovery concepts is fully recognised by higher education institutions.

Universities and other colleges organise training courses in the field of disaster mitigation for members of the public services such as fire-fighters, police officers and medics, for architects and other construction workers, environmental workers and people involved in agriculture.

Such strong attention to risk reduction through preparedness of the population confirms the commitment to, and relevance of, Civil Protection in Romania.

The following specialist universities contribute to the elaboration of studies, standards and guides in the field of disaster risk reduction: Technical University of Civil Engineering, of Bucharest; Technical University, of Timisoara; Technical University 'Gh. Asachi', of Iasi; Town-Planning and Architecture University 'Ion Mincu', of Bucharest; University 'Babes Bolyai', of Cluj-Napoca; Polytechnic University, of Bucharest; and the specialist research and development institutes: Geographical Institute of the Romanian Academy; National Institute for Building Research – INCERC, of Bucharest; National Centre for Seismic Risk Reduction – CNRRS; National Research and Development for Earth Physics Institute, of Bucharest; Studies and Designing Institute for Land Improvement – ISPIF, of Bucharest; Regional Centre for Prevention and Industrial Accidents Management, of Cluj-Napoca; and the Environment Research and Engineering Institute.

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194 Ministry of Education, Research and Innovation, Law no. 124/1995.

## 3.9 Serbia

### *Public perception of Civil Protection*

The Civil Protection sector in Serbia has a proven track record of achievements during major emergency situations, both in terms of its search and rescue and early warning capacities. Prevention activities have also been carried out as part of continuing disaster risk reduction efforts. However, serious challenges remain due to a lack of national legislation covering Civil Protection, political instability at central level and capacity gaps due to limited resources and equipment at local level. All combine to make the functioning of the Civil Protection structure complex.

### *Demography and administration*

Serbia has a population of approximately 10 million people, giving it an order of magnitude of *Level 0* according to the classification adopted in this review.<sup>195</sup> The country has a total area of about 78,000 km<sup>2</sup> and is divided into 29 districts plus the city of Belgrade, which have orders of magnitude of *Level 1*. The districts and Belgrade are further subdivided into 161 municipalities, both *Level 2* and *Level 3*. Serbia has 2 autonomous provinces: Vojvodina, with 7 districts and 46 municipalities; and Kosovo and Metohija, with 5 districts and 30 municipalities.

The Assembly of Kosovo, presently under the administration of the United Nations Interim Administration Mission in Kosovo, declared independence on 17 February 2008.

The Serbian population is heavily urbanised, with 3.5 million people living in 18 major cities with populations greater than 50,000. Some 15 per cent of the total population live in Belgrade alone.

### 3.9.1 Legislation

There are no specific laws on Civil Protection currently in force in Serbia. The existing organisational framework of Civil Protection is determined by a set of regulations and laws relevant to the functions and assignments of different public bodies involved in civil emergencies. It is worth noting that some of this legislation is not in accordance with international conventions.

The Civil Protection sector of the Republic of Serbia consists of two main structures: the Civil Protection Section of the Ministry of Defence and the Protection and Rescue Sector of the Ministry of Interior.

The intervention model adopted by the Civil Protection Section is largely based on the substantial use of volunteers and conscripts (gendarmes and soldiers) during the emergency phase. Some catastrophic events that occurred in the 1960s and 1970s proved the effectiveness of this model to cope with civil emergencies. However, the number of volunteers has fallen dramatically and their involvement in emergency phases now is often minor, if they have any role at all.

At present, there is no legal framework for the coordination of competences or tasks of the two ministries responsible for Civil Protection. In fact, noteworthy relationships and coordination have not yet been established between the two ministries.

The negative consequences of this situation are the partial dissipation of the budget allocated by the State for Civil Protection and the lack of a sharp identification of responsibilities in emergency events. Although the Government has the power to appoint specific ministries to lead operations, no specific laws or regulations have been approved by the Parliament in this matter.

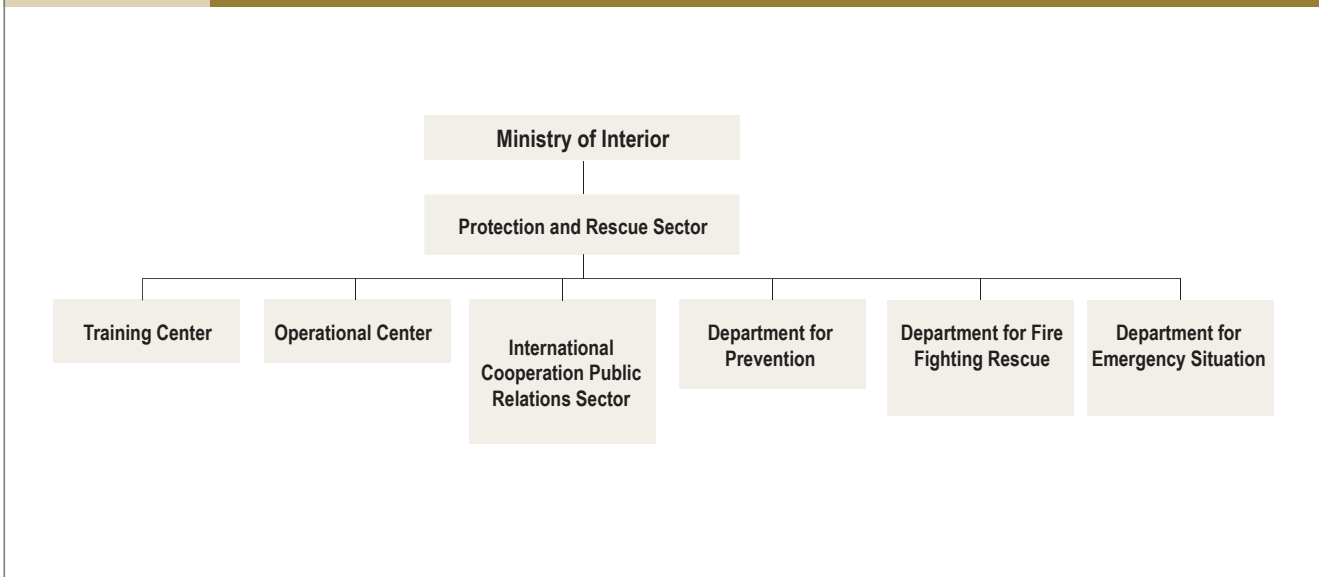
The effectiveness of the current legislation could be enhanced through a more precise identification of responsibilities in emergencies. Under the existing framework, the lack of clearly defined competences could be detrimental to an effective response. For instance, whereas the Ministry of Water has competence for the regulation of river flow, dams are usually under the jurisdiction of municipalities, which use outside contractors and private companies for maintenance and technical support.

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<sup>195</sup> The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to *Level 0* when dealing with organisations responsible for populations of 10 million to 100 million; to *Level 1* when dealing with organisations responsible for populations of 1 million to 10 million; to *Level 2* when dealing with organisations responsible for populations of 100,000 to 1 million; and to *Level 3* when dealing with organisations responsible for populations of 10,000 to 100,000.

Figure 3.38

The Serbian Protection and Rescue Sector of the Ministry of Interior<sup>196</sup>.



However, many of the capacity gaps of the existing system will be addressed following the introduction of new legislation designed to more clearly define roles and responsibilities in emergency events.

The preparation of a draft of a new law on Protection and Rescue for the Republic of Serbia was initiated in 2005. The incorporation of a set of new regulations was expected within the first six months of 2008, following amendments made by the Ministry of Defence. The Law on Protection and Rescue, once adopted by the Government, will identify the institutions charged with the protection and rescue of citizens in emergency situations within the territory of the Republic of Serbia. It will also define the roles of Government, the Ministry of Interior and local administrations in the field of Civil Protection.

The main objective of the law is to establish a more efficient organisation of Civil Protection based on a professional fire-fighting and rescue service, according to the laws and technical regulations of the EU. The law will define the basis for the establishment of professional services, specifically trained and equipped, for acting in emergency situations. A special emphasis will be devoted to the education and training of citizens, private companies and NGOs on risk reduction practices during emergency situations: to this end the high schools and the universities of Serbia will adopt specific curricula.

In the field of prevention, the law will define the methodology to be adopted for the prediction of

possible risks of disasters caused by natural hazards or technological accidents, and the protocols to use when emergency situations occur.

A specific service will monitor the application of protection and rescue regulations in the event of emergency situations.

As noted earlier, Civil Protection in Serbia is officially based on two main structures: the Civil Protection Sector of the Ministry of Defence and the Protection and Rescue Sector of the Ministry of Interior. This report refers only to the Protection and Rescue Sector of the Ministry of Interior.

The Protection and Rescue Sector is based on a Section for International Cooperation and Public Relations; a Training Centre; an Operational Centre 112; and three departments: Prevention, Fire-fighting and Rescue Units, and Emergency Situations.

The Civil Protection operational forces are the fire-fighters, the Red Cross and the police, at *Level 2* and *Level 3*, and the Army, in case of severe emergencies at *Level 1*.

The presidents of municipalities are the commanders of the local crisis committees, which have the authority to form ad hoc teams composed of personnel and means of the State police, Fire Brigade, local institutions and local military structures.

196 Courtesy of Serbian Ministry of Interior – Protection and Rescue Sector.

### 3.9.2 Civil Protection structure

The Protection and Rescue Sector produces and supplies risk reduction plans for protection against disasters caused by natural hazards and industrial-technological accidents. Additional duties consist of preparing operational plans used during emergencies, called Plans of Reaction.

The Sector is responsible for assessing the damage due to disasters caused by natural hazards, including fire, and technological incidents such as radiological, nuclear, biological and chemical contaminations. It coordinates recovery plans following emergency situations, and is responsible for the preparedness of citizens and private companies. The Sector also plays a key role in training and equipping the operational units and disseminates information to other State entities and the public.

The Hydrometeorological Service of the Republic of Serbia is an integral part of the Civil Protection system. The Service, in close cooperation with the Protection and Rescue Sector, is responsible for the operational weather forecasting on a national scale. To this end, it runs two deterministic meteorological models initialized with the data provided by the European Centre for Medium-Range Weather Forecasts and the Deutsche Wetter Dienst (DWD) Institute.

The Service's forecasting activities are also based on data acquired by an effective meteorological ground network, which consists of 28 WMO-standard synoptic stations with 1-hour sample times and equipped with GSM/GPRS communication devices; 1 upper-air radio sounding meteo station, 90 ordinary meteo stations, and 650 precipitation stations. Usually, five people operate on four shifts for each synoptic station, while at Service headquarters there is a fully operational set of four forecasters during the day shift and three during the night shift.

In cooperation with EUMET-Sat, the Hydrometeorological Service has installed an MEOS MSG HRIT/LRIT station.

The hydrological observation system of Serbia is based on a set of 211 surface-water stations and 439 ground-water stations. Some 32 stations are equipped with digital devices for continuous water-level recording and data transmission. The Service produces daily, short- and

long-term forecasts of discharges and water levels for 20 profiles of the rivers Danube, Sava, Tisa, and Velika Morava. It also forecasts extreme wave formations. In accordance with the operative plan for flood defence, the issuing of water forecasts on minor rivers (catchments) is done only during floods. Once a day, the Service transmits to the Protection and Rescue Sector a bulletin on the current situation across the whole territory of Serbia, with a forecast for probable future weather scenarios.

In cases of emergency, the Hydrometeorological Service and the Protection and Rescue Sector act in close cooperation with a continuous streaming of information produced and elaborated by forecasters on the basis of the data provided by the meteorological and hydrological stations and the radar stations.

Among the different hazards impacting Serbia, floods represent the most significant risk. The risk is intensified by the fact that a large proportion of the Serbian population lives in urban or rural settlements that are highly prone to floods.

In common with other Balkan States, Serbia registers frequent and strong seismic activity. Almost 20 per cent of the territory is classified by the MKS (*Medvedev-Karnik-Sponheuer*) seismic scale as high risk with expected earthquakes greater than magnitude 8.5. Catastrophic events struck Serbia in 1979, 1980, 1988 and, more recently, in 1998. The National Geophysical Centre reports estimated economic losses due to earthquakes of approximately US\$2.7 billion during the last 33 years.

Wildfires are frequent and widespread in Serbia during the summer season.

### 3.9.3 Human resources and costs

The total number of people involved in Civil Protection is about 3,500, of whom 300 are prevention inspectors and the remainder are fire-fighters.

In 2007 the Protection and Rescue Sector allocated about €15 million for the Civil Protection budget, a significant portion of which has been spent on the realization of a new communications network to be used by local and central authorities during civil emergencies. This represents a significant investment by the Ministry of Interior in this sector.



Table 3.27: Risk exposure and organisation in Serbia.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with event	Level 1	Level 1	Level 1	Level 1
degree of impact	high	high	high	high
<b>preparedness</b>				
prediction system	working at Level 1 and Level 2	not applicable	Level 1	not applicable
vulnerability maps	existing	existing	N/A	existing
<b>alerts and warnings</b>				
procedures	working from Level 1 to Level 3	not applicable	working from Level 1 to Level 3	not applicable
efficiency	upper-medium	low	upper-medium	not applicable
public perception	upper-medium	no	upper-medium	not applicable
<b>response and search and rescue</b>				
procedures	working from Level 1 to Level 3	locally designed	working from Level 1 to Level 3	working at Level 1
efficiency	high	low	high	high
public perception	upper-medium	no	high	upper-medium

Table 3.28: Human resources involved in Civil Protection in Serbia.

<b>human resources</b>				
<b>Level 1</b>				
	people involved in CP in 'peace periods'	public servants	private contractors	person involved in CP in 'emergency periods'
quantity	500	-	100	500+100
% of the national active population	0.01	-	0.002	0.012
<b>Level 2 and Level 3</b>				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	3,000	-	200	3,000
% of the national active population	0.06	-	0.004	0.06

Table 3.29: Average annual costs of the Civil Protection system in Serbia.

annual costs							
Level 1							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of Fire Brigade due to activities during 'emergency periods'	percentage cost of Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	2	no information available	no information available	no information available	10	no information available	12
% of the national GDP	0.0036	-	-	-	0.018	-	0.02
Level 2 and Level 3							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	operational cost of equipment, technologies and emergency assets		average annual cost of post-emergency recovery	total funding for Civil Protection	
euros (millions)	3	no information available	10		no information available	13	
% of the national GDP	0.0054	-	0.018		-	0.023	
research and development							
	investment for university departments, research agencies and/or organisations working for Civil Protection		maintenance for university departments, research agencies and/or organisations working for Civil Protection		public or private companies supplying hardware and software		
euros (millions)	N/A		N/A		N/A		

### 3.9.4 Civil Protection and society

The Protection and Rescue Sector organises training programmes for students and the public on risk reduction concepts and practices in emergency situations. Such programmes are conducted with the cooperation of local Fire Brigades and the Forest Service and the active participation of schools and the mass media.

The Sector each month organises a National Prevention Month<sup>197</sup>. During this period, forestry officers and fire-fighters visit primary and high schools to raise students' awareness of the risks that exist in their areas.

In terms of cross-border activities, the Protection and Rescue Sector is responsible for the preparation and execution of international agreements in the field of protection and rescue, and has the authority to coordinate international forces acting in emergency situations on Serbian territory.

The sector can exchange information on protection and rescue matters with international organisations and corresponding services in other countries, and receive or provide assistance in the event of emergencies. It can prepare and organise international conferences, seminars, courses, workshops and exercises in the field of protection and rescue.

The principal agreements and acts of international cooperation in the field of Civil Protection are:

- Memorandum of Intention for Cooperation with the Ministry of the Russian Federation for the Affairs of Civil Defence, Emergency Situations and Disaster Relief (EMERCOM Russia) in the field of prevention and mitigation of disasters caused by natural or man-made hazards. The first agreement was signed in July 1996 and renewed in June 2007.
- In the summer of 2007 EMERCOM Russia replied to a request for assistance, deploying a fire-fighting aircraft 'Ilyshin 76' for three days of forest-fire operations on Serbian territory.
- Memorandum of Understanding and Cooperation

197 In 2008, National Prevention Month was the month of May.

between the Protection and Rescue Sector of the Ministry of Interior and the Danish Emergency Management Agency of the Danish Ministry of Defence, signed in December 2007, regarding the protection and rescue of people and goods in disasters caused by natural or other hazards.

- Agreement between the Cabinet of Ministers of the Republic of Ukraine and the Government of the Federal Republic of Yugoslavia, which came into force in June 2004, on cooperation in the field of prevention of emergency situations and mitigation of the consequences.
- Agreements with Bosnia and Herzegovina, Bulgaria,

Croatia, the Former Yugoslav Republic of Macedonia, Greece, Montenegro and Romania are under development.

- In August 2007 the Fire Service of Greece sent a request for assistance to the Serbian Protection and Rescue Sector. The Sector dispatched 6 engines for forest-fire operations and 55 fire-fighters for 7 days on the Peloponnesian peninsula.

## 3.10 Turkey

### *Public perception of Civil Protection*

Turkey was one of the first countries in the region to adopt Civil Protection legislation, with a law on civil defence promulgated in 1958. Over time the model the law was based on, which was concerned mainly with rescue and relief operations, was revised in response to changing demands and the emergence of new hazards such as those presented by the growing industrial sector. The Civil Protection model has today evolved into one which emphasizes preparedness and the mitigation of risk.

The establishment of country-wide risk reduction programmes, such as the insertion of regular Civil Protection programmes into primary and secondary school curricula, along with the growing number of volunteers associations demonstrate that the Turkish population is ever more integrated into Civil Protection structures.

### *Demography and administration*

Turkey has a population of approximately 72 million people, giving it an order of magnitude of *Level 0* according to the classification used in this document<sup>198</sup>.

The total area of about 780,000 km<sup>2</sup> is divided into 81 provinces. Each province is subdivided into several districts. There are a total of 923 districts.

Some 70.5 per cent of the population live in urban centres. The province of Istanbul, with a population of 12.5 million (*Level 0*) is the largest in Turkey. There is a great deal of variation in the demographic size of provinces: 18 provinces have populations in excess of 1 million (*Level 1*); 21 provinces have populations between 1 million and 500,000 (*Level 2*); and 2 provinces have populations under 100,000 (*Level 3*)<sup>199</sup>.

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<sup>198</sup> The organisational complexity depends mainly on the size of the population to be dealt with: in the following we will refer to Level 0 when dealing with organisations responsible for populations of 10 million to 100 million; to Level 1 when dealing with organisations responsible for populations of 1 million to 10 million; to Level 2 when dealing with organisations responsible for populations of 100,000 to 1 million; and to Level 3 when dealing with organisations responsible for populations of 10,000 to 100,000.

<sup>199</sup> Turkish Statistical Institute (2000), 2000 Census, population by provinces and districts.

### 3.10.1 Legislation

The General National Assembly of Turkey followed the 1958 adoption of the first Law on Civil Defence by passing the Law on Measures Regarding Disasters. These two fundamental pieces of legislation established the legal basis for the organisation of the system of first-response, rescue, and emergency management in Turkey.

Subsequent legislation has included Regulations on the Prime Ministry Crisis Management Centre, introduced in 1997, while in 2000 a number of decrees focusing on risk mitigation and preparedness were adopted following the devastating 1999 earthquakes<sup>200</sup>.

In 2002 regulations were adopted on construction in areas prone to disasters caused by natural or technological hazards, covering the whole of Turkish territory.

### 3.10.2 Civil Protection structure

The Civil Protection sector is composed of three main structures established at *Level 0*:

- The General Directorate of Turkish Emergency Management.
- The General Directorate of Civil Defence.
- The General Directorate of Disaster Affairs.

The General Directorate of Turkish Emergency Management, under direct control of the Presidency of Ministers, was established after the earthquakes of 1999 to create an upper tier capable of coordinating the actions of different actors at local, national and international level during the emergency phase of disasters. The General Directorate also acts as inspectorate on the actual implementation of Civil Protection laws and regulations, as well as for the design and implementation of tactical and strategic plans.

The General Directorate of Civil Defence was established in 1968 within the Ministry of Interior. Its structure is based on provincial and district civil defence directorates, while a number of civil defence experts are detached within public and private institutions.

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<sup>200</sup> Legislation includes the Decree on Mandatory Earthquake Insurance; Guidance on Participation of Volunteers in Civil Protection Services; Decree Establishing the Prime Ministry Emergency Management General Directorate; Regulations on the Establishment, Responsibilities, Operational Principles and Fundamentals of Civil Protection Search and Rescue Units.

The General Directorate of Civil Defence is subdivided into five divisions:

- **Operational Division:** in charge of first response and search and rescue operations, and to ensure communications during the emergency phase. This division is the reference structure for fire departments in the field of fire protection and prevention.
- **Planning and Technical Division:** its main tasks are risk assessment, early-warning measures and resource planning.
- **Training and Education Division:** responsible for the training of technical personnel and civil defence workers, as well as for the education of citizens and students, and the publication and broadcasting of information concerning hazards and vulnerability to communities.
- **Equipment and Financial Division.**
- **Defence Secretary Division.**

At local level the Provincial Directorates of Civil Defence, under the authority of governors, manage the Search and Rescue Units for Civil Defence. Such units are generally based on battalions of 120 first-responders ready to intervene 24/7/365 in cases of disasters caused by natural or technological hazards. Approximately 3,000 people, including technical and medical staff, are currently deployed within 11 operational units. Each unit can contain several battalions. Headquarters are in the provinces of Adana, Afion, Ankara, Bursa, Diyarbakir, Erzurum, Istanbul, Izmir, Sakarya, Samsun and Van. Each unit has an operational range that encompasses 5-10 provinces. In some provinces the units operate with just 20 to 30 people.

The General Directorate of Disaster Affairs was established within the Ministry of Public Works and Settlement. According to the National Special Law n. 3914 on risk assessment, urban planning and inspection, the General Directorate's main competence is the production and issuing of hazard maps relevant to risk-prone areas subject to earthquakes, landslides, rock falls and avalanches.

A national disaster database, the National Disaster Archive System of Turkey, is presently managed and maintained by the General Directorate of Disaster Affairs. The database contains all the data relevant to the main

disasters that have occurred in Turkey within the last 100 years, and can be queried through a GIS environment.

The General Directorate of Disaster Affairs is the main actor during the phase of emergency relief operations following disasters. Its competences encompass the implementation of short- and long-term measures for immediate temporary sheltering, and the adoption of temporary measures for the protection of citizens.

According to legislation in force until 2000, the State had a duty to provide compensation, in the form of access to a 20-year interest-free loan, to people whose properties had been destroyed during disasters. A very large portion of the average US\$250 million annual budget of the General Directorate of Disaster Affairs was allocated to this facility.

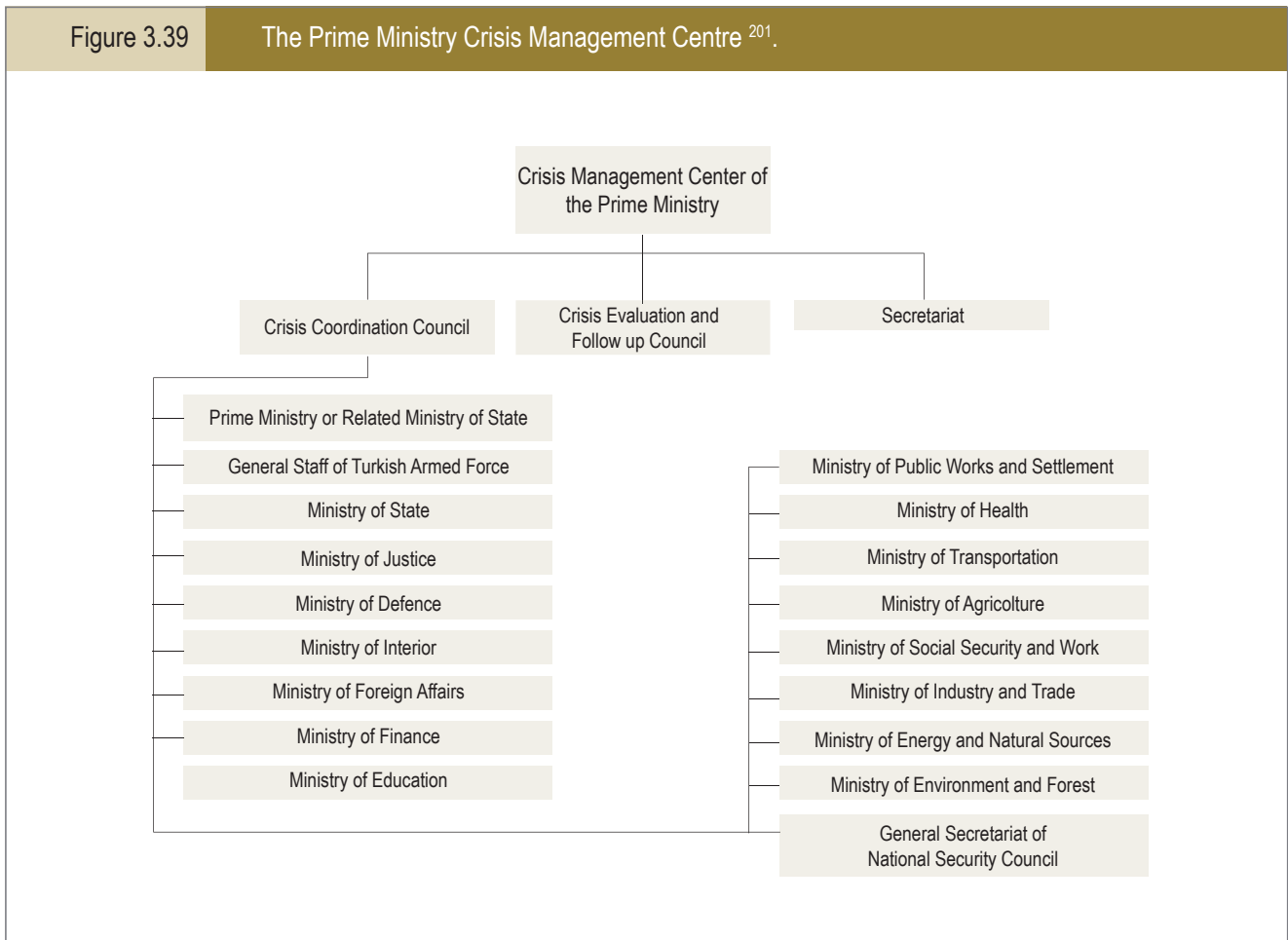
However, the catastrophic earthquakes of 1999 and the subsequent collapse of about 200,000 buildings demonstrated the impossibility of sustaining this right and the relevant law on reconstruction was abolished. At the same time a decree was adopted on mandatory earthquake insurance which made it compulsory for every property-owner to buy insurance covering damage in the event of earthquakes.

The scheme, which potentially affects 13 million properties across Turkey, is monitored by the General Directorate of Disaster Affairs. Its main duty is the inspection of urban planning at province level and to do this it has a staff of 650, including 350 civil engineers and architects dispersed among the central headquarters in Ankara and the 81 provincial offices. It should be noted that building supervision activities are being outsourced to private contractors and only 21 provinces are still under the competence of the General Directorate of Disaster Affairs.

A draft Law on Civil Protection has currently reached discussion stage at the Turkish National Assembly. Such a law will establish a new scheme for risk management in Turkey based on a unified structure of Civil Protection under the Presidency of the Ministry Council, namely the Turkish Disaster and Emergency Management General Directory.

In terms of exposure to natural hazards, geophysical hazards cause the most damage and remain the most significant risk in Turkey. However, extreme weather events caused by the effects of climate change are increasing in frequency with considerable adverse

Figure 3.39 The Prime Ministry Crisis Management Centre <sup>201</sup>.



impacts. The number and severity of floods and wildfires are increasing, especially in the Mediterranean area where the presence of extended urban sprawl and the exploitation of territory for new infrastructure developments, settlements and industry have exposed a growing number of people to the potentially adverse effects of such events.

The Prime Ministry Crisis Management Centre, which is based on two councils and one secretariat, was established in 1997 at *Level 0* with the aim of coordinating all rescue activities during national emergency phases. All Ministers with responsibilities for prevention, mitigation or direct intervention during emergency situations are represented on the Crisis Coordination Council, which is the main operational entity activated during a national emergency. The General Staff of the Turkish Armed Forces is also represented on the Council (see Figure 3.39).

Under the coordination of the Prime Ministry Crisis Management Centre, each Ministry can activate a Ministerial Crisis Management Centre, which is responsible for the coordination, implementation and administration of the operational tasks within the Ministry, and for the relationship with public institutions, and the organisations involved in the emergency.

The Provincial Crisis Management Centres, at *Levels 0, 1, 2* and in some cases *3*, under the responsibility of local governors, are the operational centres in charge of the coordination of all the activities carried out at local level during the emergency phase, including the activation of military forces, police and Civil Defence Units or the inclusion of private companies in the operations.

The governors are also on duty for the coordination of Municipal Fire Brigades (*Level 2*) and for the preparedness of local Civil Defence Units (*Level 2*) on the basis of information and alerts provided by the General Directorate of Meteorology (weather forecasts) and General Directorate of State Water Affairs (floods), under the Ministry of Forestry and Environment.

201 Courtesy of the General Directorate of Civil Defence.

Table 3.30: Risk exposure and organisation in Turkey.

NATURAL HAZARDS	floods, flash floods	landslides, debris- and mud-flows	forest fires	earthquakes
level dealing with event	Level 0	Level 1	Level 1	Level 0
degree of impact	High	high	high	high
<b>preparedness</b>				
prediction system	working at Level 1	not applicable	Level 1	not applicable
vulnerability maps	existing	existing	existing	existing
<b>alerts and warnings</b>				
procedures	working from Level 1 to Level 2	not applicable	N/A	not applicable
efficiency	upper-medium	low	N/A	not applicable
public perception	upper-medium	no	N/A	not applicable
<b>response and search and rescue</b>				
procedures	working from Level 0 to Level 2	locally designed	working from Level 1 to Level 3	working at Level 0
efficiency	high	low	high	high
public perception	upper-medium	no	high	upper-medium

The establishment of volunteer search and rescue teams was initiated following the earthquakes of 1999. At present, 17 fully operational organisations at national level (*Level 0*) and 94 at provincial (*Levels 1 and 2*) or district level are ready to intervene in the event of disaster. The teams are composed of small units specialized in specific types of intervention and trained and equipped according to the standards defined by the General Directorate of Civil Defence.

The Turkish State Meteorological Service, founded in 1937, is the official technical advisor in charge for hydrometeorological monitoring and forecasts. The Service provides Civil Defence Units, the Army and other public bodies with meteorological information. It is also responsible for the management of climatological data gathered by the national network of meteorological stations. The Service has full membership of WMO, ECMWF and EUMETSAT. It should be noted that the growth of the industrial sector has created new technological hazards and new risks associated with the effects of natural hazards on industrial facilities and infrastructure.

A circular on a Local Emergency Plan for Major Industrial Accidents, based on the Seveso I Directive, was issued by the Ministry of Environment and Forestry in 1996. The Seveso II Directive 96/82/EC (as amended by Directive 2003/105/EC) is currently being examined and discussed by relevant stakeholders ahead of adoption in the law on Control of Major Industrial Accident Hazards.

### 3.10.3 Human resources and costs

Tables 3.31 and 3.32 contain details of the number of people involved in Civil Protection activities in Turkey in both ‘times of peace’ and ‘times of emergency’, as well as a breakdown of the costs involved.

### 3.10.4 Civil Protection and society

In terms of education, training and research, the General Directorate of Civil Defence is the main actor in this field. Education is conducted through official courses at the Civil Defence College in Ankara, mainly addressing the technical skills of the personnel employed in units or through specific

Table 3.31: Human resources involved in Civil Protection in Turkey.

HUMAN RESOURCES				
Level 0				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	100 <sup>(A)</sup> +300 <sup>(B)</sup>	100 <sup>(A)</sup> +300 <sup>(B)</sup>	no information available	100 <sup>(A)</sup> +300 <sup>(B)</sup>
% of the national active population	0.0008	0.0008	-	0.0008
Level 1 and Level 2				
	people involved in CP in 'peace periods'	public servants	private contractors	people involved in CP in 'emergency periods'
quantity	550 <sup>(A)</sup> +2,800 <sup>(B)</sup>	550 <sup>A</sup> +2,800 <sup>B</sup>	no information available	550 <sup>(A)</sup> +2,800 <sup>(B)</sup> + 35,000 <sup>(C)(D)</sup> +20,000 <sup>(E) (D)</sup>
% of the national active population	0.007	0.007	-	0.12

Notes to Table 3.31:

- (A) Public servants working for the General Directorate of Disaster Affairs.
- (B) Public servants working for the General Directorate of Civil Defence.
- (C) Fire-fighter detachments distributed around the country (public servants under the authority of municipalities).
- (D) Such a figure is the maximum at national level. It is quite improbable that in a single catastrophic event they would be fully engaged. Usually a catastrophic event affects only part of the country.
- (E) Organised Volunteers. Most are distributed in detachments around the country.

modules defined at central level and implemented at provincial level containing both theoretical programmes and exercises. Since 1960, under the responsibility of the General Directorate of Civil Defence, a college for the education of technical personnel involved in emergency management has been operating in Ankara. The college provides students with a comprehensive curriculum on civil defence encompassing radiological, nuclear, biological and chemical scenarios; search and rescue techniques; fire-disaster risks and protection; resource management; and planning.

The General Directorate of Disaster Affairs has a fruitful collaboration with universities in the field of risk assessment and mitigation, especially with reference to earthquakes.

The General Directorate of Civil Defence has a minor involvement with universities, whose role is limited to the participation of professors in courses run at the Civil Defence College in Ankara.

In terms of cross-border activities, the Governments of Turkey and Greece have signed a protocol for the establishment of a Joint Hellenic-Turkish Standby

Disaster Response Unit to improve joint cooperation and response to disasters. With the aim of implementing this protocol a joint exercise was conducted successfully in Ankara in December 2006.

Other bilateral agreements include a Memorandum of Understanding with France in the field of search and rescue, which is currently under development, and a Memorandum of Understanding with Sudan for the technical training of Sudanese Civil Protection personnel, which is set to be signed.

Technical cooperation agreements have been signed with UNDP and cooperation activities are currently ongoing with Tajikistan, Kazakhstan, Kyrgyzstan and Ukraine.



Table 3.32: Average annual costs of the Civil Protection system in Turkey.

ANNUAL COSTS							
Level 0							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	percentage cost of Fire Brigade due to activities during 'emergency periods'	percentage cost of Forest Service	operational cost of equipment, technologies and emergency assets	average annual cost of post-emergency recovery	total funding for Civil Protection
euros (millions)	5 <sup>(A)</sup> +10 <sup>(B)</sup>	no available information	no available information	N/A	5 <sup>(A)</sup>	no available information	15
% of the national GDP	0.0023		-	-	0.0008	-	0.0023
Level 1 and Level 2							
	public servants involved in CP in 'peace periods'	private contractors involved in CP in 'peace periods'	operational cost of equipment, technologies and emergency assets		average annual cost of post-emergency recovery	total funding for Civil Protection	
euros (millions)	50 <sup>(A)</sup> +35 <sup>(B)</sup>	no available information	15 <sup>(A)</sup>		200 <sup>(B)</sup>	310	
% of the national GDP	0.013	-	0.0023		0.03	0.045	
Research and development							
	investment for university departments, research agencies and/or organisations working for Civil Protection		maintenance for university departments, research agencies and/or organisations working for Civil Protection		public or private companies supplying hardware and software		
euros (millions)	N/A		N/A		N/A		

Notes to Table 3.32:

(A) General Directorate of Disaster Affairs.

(B) General Directorate of Civil Defence.



# 4

**Conclusions and  
recommendations**

For most countries of the SEE region, efforts are still ongoing to ensure that the mechanics of disaster risk reduction are in place, that preparedness plans are diffused to all administrative levels, financial resources are allocated to emergency response and recovery programmes and procedures are established for post-event analysis so that past mistakes can be avoided and underlying causes of risk identified.

Throughout the SEE region there is a shortage of information about potential vulnerabilities. Detailed maps or models are not yet generally available charting the numbers of human settlements and installations exposed to risk, or detailing the diffusion patterns of landslides or average return periods of flooding. Similarly, models have yet to be created showing the resilience of the existing building stock and infrastructure in the event of a disaster such as an earthquake.

This lack of important data means that the ability of SEE countries to interface with the EU-led GMES initiative is seriously compromised. Across the region monitoring systems need to be updated and in some cases rebuilt. Early-warning systems are generally in need of strengthening, although those of Bulgaria, Romania and Turkey appear to be more developed.

Moreover, the need to disseminate disaster risk reduction information to all sectors, levels, key institutions and other stakeholders is not yet fully perceived and the mechanisms do not yet exist to facilitate a dialogue to help build a national consensus about the need for disaster risk reduction. It is significant to note that in SEE countries the perception that citizens have the right to be protected from excessive risk is negligible compared to the level of perception among citizens of the EU.

National policy frameworks addressing the development of Civil Protection capacities are present in all SEE countries. However, variation occurs in the way in which these policy frameworks are addressed in countries such as Albania, Bosnia and Herzegovina, and Moldova, which tend to emphasize development at central level with less emphasis on the decentralization of competences to local levels compared to the other countries in the region.

Discrepancies occasionally exist between political commitment, as manifest in government policy, and the practical application of that policy. Consequently,

whereas at policy level the need to improve prevention, preparedness and response is often incorporated, at an operational level this commitment often does not translate into concrete action. Post-disaster reviews, for instance, routinely undertaken to review the effectiveness of Civil Protection systems, are seldom conducted in the majority of SEE countries despite the valuable lessons they can provide for pre-disaster planning by helping to identify both the causes of risk and lessons learned.

Financial and human resources for Civil Protection are in short supply in most SEE countries and whereas the proportions of GDP allocated to Civil Protection sectors are comparable with the levels of the EU case studies the actual figures involved are small. Furthermore, the amount of human and financial resources committed to risk mitigation, preparedness and response activities is often at variance with the level decreed by legislation.

When measured as a proportion of the total active population the numbers of people involved in Civil Protection are not dissimilar to EU case study levels, although again the actual numbers are small. There is also substantial divergence over the decentralization of functions, with some countries giving little authority and few resources to local levels, whereas in other countries it is the converse.

In terms of how effective national policies have been at reducing risk it is clear that more work needs to be done in this respect. Whereas in the EU statutory elements of disaster risk reduction incorporated into building codes are generically applied, in SEE countries the enforcement of these codes appears to be a challenge, although there is a more systematic incorporation in Bulgaria, Croatia, Romania, Serbia and Turkey. There is also divergence in the ways in which administrations enforce the use of agreed disaster risk reduction procedures on major infrastructure projects. This is especially significant because SEE countries are in the process of rehabilitating their infrastructures. The lack of resilience of infrastructure is a major threat to long-term development goals.

To fully implement disaster risk reduction policies will require the focusing of initiatives in all SEE countries. The strengths and weaknesses of existing Civil Protection sectors in each country, along with recommendations for areas of enhancement, are identified below.

### **4.1.1 Albania**

The capacity of the current Civil Protection structure to respond to major events is burdened with procedural operations which could be detrimental to effective emergency responses. The chain of command appears quite cumbersome and although county prefects and municipal presidents are invested with some powers, their competences are not sharply demarcated. The control scheme is still based on a system of centralized decision making under which the only effective way to coordinate a reliable response is to proclaim a State Emergency and convene an Inter-Ministerial Committee.

While the number of people living in areas prone to risk is constantly increasing, there are significant capacity gaps in the amount and quality of resources available and reliable responses cannot be guaranteed. Furthermore, the effects of climate change are particularly dramatic for Albania: the frequency and the magnitude of wildfires, flash-floods or landslides are increasing significantly, while the capability of coping with these events is limited.

The inclusion of monitoring structures within Civil Protection operational activities remains marginal. The hydrometeorological services do not use anticipation tools or forecasts and the hydrometeorological monitoring network is based on only a small number of stations equipped with few sensors. In particular, the lack of numerical weather forecasts, runoff models and wildfire risk models represent a serious deficiency with dramatic impacts, especially on the preparedness and early-warning phases.

However, the current efforts of the Department of Civil Emergency are ambitious and focused on the inclusion of Albanian Civil Protection structures within a European perspective, according to organisational and technical standards at EU levels. The participation of Albania in regional initiatives, the cooperation with the United Nations for the establishment of a National Platform, the participation in international exercises and the signing of memorandums of understanding with regional and other European countries represent a road map to achieving modern Civil Protection structures.

Further achievements could be made through the downscaling of risk assessments and vulnerability studies to local level, which could have a positive impact on preparedness.

### **4.1.2 Bosnia and Herzegovina**

The dramatic consequences of the long conflict in Bosnia and Herzegovina still represent a major challenge to the Government of the Federal Republic and for the Civil Protection structures of the entities and Brčko federal district.

It emerges that while the entities and Brčko federal district have established a reasonably efficient system for ordinary emergencies, there remains a real need to build capacities to be able to effectively react to and deal with extreme events. Non-structural issues such as a lack of information, communication and coordination are compounded by a shortage of resources, including equipment, to potentially jeopardize the efficient functioning of Civil Protection in the event of severe emergencies.

The dimensions of Bosnia and Herzegovina and the political characteristics of this federal State suggest the adoption of a quite different model of Civil Protection in which the Central Sector in the Ministry of Security could play a more significant role, especially in the strategic fields of risk assessment, prevention and preparedness.

The Civil Protection sector of Italy, the structure of which is based on a distributed network of autonomous regional centres coordinated by a central node, could be a potential and interesting model and some aspects could be adapted to fit the requirements of Bosnia and Herzegovina.

It should be noted that the legislation on Civil Protection is in transition from the current structure to a new framework of laws prepared with UNDP and NATO support.

### **4.1.3 Bulgaria**

The overall situation regarding disaster risk reduction policies in Bulgaria appears quite positive. Civil Protection benefits from a comprehensive legislative framework, from the implementation of an efficient early-warning system and from the many collaborative initiatives between the academic community and national and local research institutions involved in disasters prevention.

Among the major achievements of the Bulgarian Civil Protection sector is the establishment of an early-warning system which can be considered compliant with those of the EU case studies.

Other achievements include the high level of public participation in Civil Protection. By law each citizen of the Republic of Bulgaria has the right, as well as an obligation, to be trained in protection and rescue and has the right to receive full and timely information about all threats of disaster, as well as all available protection measures and activities. Knowledge, innovation and education in Bulgaria are used as bases for building a culture of safety and resilience.

#### 4.1.4 Croatia

There are several positive aspects to the way in which a disaster risk reduction agenda is being pursued in Croatia, especially with reference to Civil Protection structures, with organisations at both *Level 1* and *Level 2* operating in accordance with disaster preparedness plans. Moreover, there is regular training for technical and administrative personnel and a fully-developed 112 emergency number system.

The establishment of the National Protection and Rescue Directorate represents an attempt to create a unique Civil Protection structure.

Nevertheless, the Directorate does not include all the necessary competences relevant to risk assessment, either for the long-term planning phase or the medium- or short-term forecasting phase, which is partially demanded by external organisations. Addressing this limitation would be beneficial for a complete early-warning system.

Although there are some efforts to insert risk reduction goals into national policies — such as the Environmental Plan, adopted in 1999, defining measures for alleviating direct effects on the environment, or the Technical Standards for the Construction of Buildings in Seismic Areas, adopted in 1964 — these rules have no legal force of law<sup>202</sup>.

Knowledge, innovation and education are being partially used as bases for building a culture of safety and resilience, although at present Civil Protection programmes are addressed only to pre-school children; there are no such education programmes at high-school or university levels.

One way to develop the disaster risk reduction agenda and encourage a culture of safety and resilience would be to

strengthen the effective participation of the public, which up to now has considered Civil Protection only in terms of a set of rules to be followed in the event of an emergency.

Significant advances could be made by more clearly defining risk assessment procedures, especially those associated with future hazard scenarios such as the potential impact of climate change.

Croatia could make further progress by drafting emergency plans at *Level 1* and *Level 2* for different forms of risk. National legislation already requires the drafting of some specific emergency plans, such as those associated with industrial hazards.

#### 4.1.5 Former Yugoslav Republic of Macedonia

Although both technical and institutional capacity for disaster management is in place in the FYR of Macedonia, restrictions remain due to the fact that disaster preparedness plans still require implementation and, in some cases, upgrading.

However, to build capacities in this area the Crisis Management Centre has started an inter-sectoral working group to develop methodologies for evaluating risks and hazards; developing possible risk and disaster scenarios; making plans for dealing with risks and hazards; and determining the standard operational procedures of Crisis Management System stakeholders.

The Protection and Rescue Directorate has the task of developing plans for the organisation and preparation of the protection and rescue system, including the supply of material resources. This includes managing and assessing the preparedness of protection and rescue forces, planning and organising training exercises and participation in collective protection and rescue systems outside the territory of the FYR of Macedonia.

Nevertheless, the Directorate does not include all the necessary technical expertise relevant to risk assessment, either for the long-term planning phase or the medium- or short-term forecasting phase. Due to funding constraints, the quality of the services provided by these organisations is limited.

Efforts are under way to develop and strengthen the capacities of the country's institutions to build resilience to

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202 Information about disaster reduction based on the Yokohama strategy and action plan – Croatia is available online at <http://www.preventionweb.net/english/countries/europe/hrv/?x=14&y=9>

hazards. This process is being facilitated by the ongoing harmonization of the legislation of the FYR of Macedonia with European standards in disaster risk reduction.

One of the major factors limiting the country's progress towards the implementation of effective policies on disaster risk reduction and preparedness is the shortage of financial resources for the purpose. This shortage impacts other factors limiting its Civil Protection capacities, including the lack of a comprehensive monitoring system and the need for a solid reorganisation of information and early-warning systems.

The Republic Institute of Hydrometeorology is a case in point. In principle it has a very important role in this framework, as it should provide early-warning information related to flash-floods, extreme rainfall events and wildfires. However, for it to be able to provide levels of hydrometeorological and environmental information approaching European levels would require substantial financial investment.

Financial limitations are also affecting the country's ability to pursue disaster risk reduction policies in the area of land-use restrictions, natural resource management and adaptation to climate change, despite some relevant initiatives such as the 'Plan of Operations for Protection and Defence against Floods of Threatened Areas'.

Further achievements could be made in the field of cooperation between academic and research communities and national or local institutions dealing with risk reduction. To further this end, the Crisis Management Centre is establishing a cooperation network with the academic and expert community in the form of a disaster crisis management centre of excellence, located at the State University Ss. Cyril and Methodius – Skopje, with 18 focal points, each dealing with a specific hazard.

The FYR of Macedonia would benefit from significant financial investment to facilitate enhanced response and recovery, and towards the purchase of new technologies for risk assessment involving earthquakes and extreme hydrometeorological events.

#### **4.1.6 Moldova**

Since Moldova declared independence in 1991, it has taken significant steps to establish a modernized and reformed administrative structure.

This process is leading to the harmonization of Moldovan legislation with a new reality and with EU standards and has had a direct impact on the country's policies addressing these areas. A key piece of legislation, the Law on Civil Protection, promulgated in 1994, includes the design and implementation of preparedness, response, recovery and rehabilitation measures.

But although progress has been made in terms of developing institutional capacity, gaps are present in the process of decentralisation, with local authorities having little effective power.

Short-term goals could be achieved effectively by enhancing the skills and qualifications of national Civil Protection officers through capacity building activities in organisations and administrations up to and including central level.

It would also be very beneficial to prepare a national strategy to enhance the national hydrometeorological service through the introduction of a law clarifying the missions, duties and rights of the various actors in the hydrometeorological and environmental sectors.

Collaboration between the data provider and end user needs to be strengthened.

In terms of long-term goals, the establishment of control and communication systems would improve the efficiency of resource management, while achieving stability of financial planning would facilitate enhanced education and training of fire-fighters and improvements to equipment and maintenance.

The cost of investment in a modern high-tech observation network is very high and it is therefore vital to promote regional cooperation and data-sharing, and to support regional centres of excellence. Participation in ECMWF, EUMETSAT and EUMETNET would strongly support the development and improvement of the Moldovan hydrometeorological services in general, and would also promote production of required data and services to the various socio-economic sectors.

From an operational point of view, most of the technologies available for protection and rescue activities in Moldova are outdated and there is strong need for investment in this area. Vehicles and machinery are old and have not been renewed since the declaration of independence in 1991.

The establishment of the Civil Protection and Emergency Situation Service represents an important step towards the creation of a unique Civil Protection structure, although most of the competences relevant to risk assessment, either for the long-term planning phase or the medium- or short-term forecasting phase, have yet to be developed.

Enhancements to the information network could improve efficiencies, especially with regard to vulnerabilities to specific hazards. As part of this, upgrading the early-warning system, which presently comprises a network of out-dated Soviet-era sirens, could improve the reliability of the response in the event of an impending emergency.

Further achievements could be made by focusing national policies on risk reduction efforts and clarifying the procedures involved in the assessment of the level of risk and the potential impact of hazards on all major development projects.

There is still a lack of effective participation of the public, although this could be addressed through expanding education programmes, which at present target only school children. Interest in disaster risk reduction in universities is at best only marginal and an expansion of education at this level could represent a good opportunity to encourage the development of a culture of safety and resilience.

Further advances could be made by establishing an effective legal framework for cooperation between academic and research communities and national and local institutions dealing with disaster risk reduction, and through the expansion of collaboration between the Civil Protection and Emergency Situation Service and external institutions, both academic and private.

Significant advances could be made by more clearly defining risk assessment procedures, especially given the potential risks associated with future hazard scenarios such as those posed by climate change. At present, the only risk maps in existence are those involving seismic hazards that are a legacy of the Soviet period.

#### **4.1.7 Montenegro**

Despite a lack of funds and complications due to social and economic factors, it emerges that the Government considers the establishment of a reliable Civil Protection structure as critical for the development of the country.

Among SEE countries Montenegro is one of the keenest to establish institutional relationships and collaborations with other European countries and international organisations. The country's recent accession into NATO and its potential EU candidacy underlie Montenegro's particular interest in adopting EU standards and regulations.

Within this framework, the cooperation established with the Danish Emergency Management Agency in the area of institutional capacity building and disaster preparedness has proved successful. Montenegro has signed bilateral agreements with Croatia and with Bosnia and Herzegovina.

Such agreements have defined a common protocol of mutual cross-border cooperation to be followed in the event of disasters caused by natural hazards or technological incidents. Further agreements are under discussion with Serbia, the FYR of Macedonia, Albania and Slovenia, while specific memorandums of understanding in the fields of education, technical training, preparedness and prevention are under discussion with Turkey and Italy.

The Sector for Emergency Situations and Civil Security in the Ministry of the Interior and Public Administration is the official structure in charge of risk management, preparedness and search and rescue in cases of emergencies involving natural or technological hazards. It is involved in a programme that will establish in 2009 specific Civil Protection units, formed by volunteers, which will be deployed together with municipal units in emergencies.

The Sector for Emergency Situations and Civil Security has developed a roadmap for the establishment of an effective Civil Protection system backed by comprehensive legislation.

Further achievements could be made by significantly enhancing risk prevention activities, forecasting and resource management through the well-coordinated efforts of the Sector, universities, the private sector and local administrations.



#### **4.1.8 Romania**

In Romania, technical and institutional capacity for disaster management and preparedness is in place at all administrative levels, and regular training is conducted.

The country is rapidly developing an understanding and appreciation of how to address disaster risk reduction issues. As part of this process, Civil Protection is viewed not only in terms of 'protection and rescue', but also as the more complex idea that citizens have the right to safety at home, at work and while travelling around their country.

In 2001 a national report regarding disaster management in Romania was developed to assess the impact, intensity and evolution of the main types of hazards affecting the country and identify vulnerabilities. It examined the human, material and financial resources available for hazard management and assessed which buildings and which elements of infrastructure, including roads and bridges, were vulnerable to potential hazards. The document also considered criteria such as levels of preparedness and the degree of involvement of local communities in Civil Protection activities.

The use of early-warning systems and technologies is well established, especially with regard to floods and dangerous meteorological phenomena. Systems are in place to monitor, archive and diffuse data and there is a permanently-operational national hydrometeorological informational system, although one important improvement could be the implementation of probabilistic approaches into the forecasting and early warning of flash floods. Efficient flow of information ensures a permanent connection with the system's target objectives.

The substantial reduction in human and material losses during the most recent floods is considered testament to the system's efficiency.

Knowledge, innovation and education in Romania are being used to build a culture of safety and resilience, a process which is facilitated by the fact that generally access to information is a constitutional right. Environmental protection legislation, for instance, provides a special right of accessing information on environmental quality, while the Law on Defence against Disasters establishes the duty to inform the public via the media about potential risk areas, imminence of potential disasters and their likely consequences, and protection measures. The Ministry of Education, Research and Innovation

pays special attention to the use of training programmes in schools to encourage an awareness of risk and risk reduction concepts. Analytical training programmes and special materials have been developed by commissions on every type of disaster and efforts have also been made to promote Civil Protection training in universities. Although it does not provide all the relevant know-how, tools or methodologies relevant for disaster risk reduction activities, there is a functioning and efficient system in operation of collaborative initiatives between the academic community and national institutions involved in disaster prevention.

Risk reduction concepts already form part of national policy and are being realised through non-structural channels such as urban planning and building codes. Risk maps are being developed covering every locality considered to be in a risk area to chart the risks posed by hazards including floods, earthquakes and landslides. The maps identify hazards and populations at risk and include information about measures needed to prevent disasters caused by natural or technological hazards. The maps will be accessible by all interested parties and will be included in urban development plans to manage building and land use.

Furthermore, risk assessment procedures are reasonably well established, although further development could enhance the ability to cope with potential future hazard scenarios, especially those related to climate change.

#### **4.1.9 Serbia**

Despite a proven track record of achievements during major emergencies, the Civil Protection sector in Serbia faces significant challenges due to a lack of relevant national legislation, political instability at central level and capacity gaps due to limited resources and equipment at local level. All combine to make the functioning of the Civil Protection structure complex.

At present, there is no legal framework for the coordination of competences or tasks of the two ministries responsible for Civil Protection. Relationships and coordination between the Ministry of Defence and the Protection and Rescue Sector of the Ministry of Interior need to be significantly strengthened.

The negative consequences of this situation create a lack of clarity over the identification of responsibilities in emergency events. Although the Government has the power to appoint

specific ministries to lead operations, no specific laws or regulations have yet been approved by the Parliament in this matter.

However, many of the capacity gaps of the existing system will be addressed following the introduction of new legislation designed to more clearly define Civil Protection roles and responsibilities. In particular, the adoption of a new Law on Protection and Rescue, once adopted by the Government, will identify the institutions charged with the protection and rescue of citizens in emergency situations. It will also define the roles of Government, the Ministry of Interior and local administrations in the field of Civil Protection.

The main objective of the law is to establish a more efficient organisation of Civil Protection based on a professional fire-fighting and rescue service, according to the laws and technical regulations of the EU. The law will define the basis for the establishment of professional services, specifically trained and equipped, for acting in emergency situations. A special emphasis will be devoted to the education and training of citizens, private companies and NGOs on practices during emergency situations. To this end, the high schools and the universities of Serbia will adopt specific curricula.

In the field of prevention, the law will define the methodology to be adopted for the prediction of possible risks of disasters caused by natural hazards or technological accidents, and the protocols to use when emergency situations occur.

Within this framework, the competences and the operational capabilities of the HydroMeteorological Service could play a critical role in establishing a reliable and effective monitoring system and forecasting service. To this end, the collaboration and cooperation of the Service with analogous European structures, within European initiatives, instruments or programmes such as GMES, FP7 and IPA, should be considered as a major step towards the establishment of a modern Civil Protection sector.

The overall situation regarding disaster management in Serbia is quite positive. Further achievements could be made through a programme of investment to improve relatively limited response and recovery capabilities.

#### **4.1.10 Turkey**

Turkey already has a valuable and complex system of Civil Protection, which is both effective and reliable and has major strategic importance for the EU. The establishment of a meshed network of volunteer units, the promotion of education programmes and the adoption of new curricula and university courses have helped to further enhance the public perception of Civil Protection.

The overall impression of the organisation of Civil Protection in Turkey is positive. Many initiatives have been carried out to enhance capacities to respond to major events at local and national levels, and several initiatives are ongoing to strengthen capacities at local and province levels during the emergency and post-event phases.

Furthermore, specific technical structures and schools for the training of personnel working in operational Civil Protection units are in place and there is constructive cooperation with universities. The technical level of the research centres involved in prevention programmes is solid.

A draft law on Civil Protection has reached discussion stage at the Turkish National Assembly. Such a law will establish a new scheme for risk management, namely the Turkish Disaster and Emergency Management General Directory, based on a unified structure of Civil Protection under the Presidency of the Ministry Council. The new structure has been designed with the aim of creating a unique upper general directorate with wider powers and direct control over the overall organisation of Civil Protection.

The Decree on Mandatory Earthquake Insurance has also helped build disaster resilience through raising the awareness of the potential consequences of disasters among people living in risk-prone areas.

The Seveso II Directive 96/82/EC, as amended by Directive 2003/105/EC, is currently being examined and is under discussion by relevant stakeholders ahead of adoption in the Law on Control of Major Industrial Accident Hazards.

## Recommendations

South Eastern Europe has a history of vulnerability to disasters caused by natural and technological hazards, many of which transcend borders and exceed the management capacities of individual countries. Because of their high levels of vulnerability, and the relatively small size of the countries in the SEE region, all national administrations would benefit from closer regional cooperation in disaster risk reduction, both technologically and organisationally. The areas in which such transnational cooperation would be of most value are:

- Vulnerability information, including detailed maps and models charting the numbers of human settlements and installations exposed to risk; the diffusion patterns of landslides; the areas exposed to the risk of flooding and the average return periods of inundation; hazardous transport routes; and models recording the resilience of the existing building stock and infrastructure to earthquake damage.
- Trans-boundary monitoring systems updated or even rebuilt using specifications similar to those of Civil Protection organisations of the EU case studies.
- Trans-boundary early-warning systems, established adopting specifications similar to those of Civil Protection organisations of the EU case studies.
- Strengthened capacity building of technical and scientific bodies and enhanced communication between scientific bodies and Civil Protection sectors.

The launch of GMES ERCS services and interfaces is an opportunity to maximise the potential benefits of a thorough upgrade of the Civil Protection systems in South Eastern Europe.

## **ANNEXES**

- ANNEX 1            Memorandum for the interview on SEE Civil Protection structure, role and mandate in Disaster Risk Reduction
- ANNEX 2            List of contacted organisations and institutions
- ANNEX 3            List of documents provided by the contacted organisations and institutions
- ANNEX 4            UNISDR terminology
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## **ANNEX 1**

*Memorandum for the interview on SEE Disaster Risk Reduction: Civil Protection structure, role and mandate*

### **1) LEGISLATION**

The right of a person to be protected from the extremes of climate, of day-to-day weather, of ground motion, of bad infrastructure management and of industrial failures is a characteristic of the level of social and economical development of European society. In EU countries the right of the citizen to safely stay home, to safely work and travel everywhere in her/his country is presently acknowledged by common law.

We would like to review the legislation status of your country in order to report about its recent evolution, in terms of time and objectives, to compare it with other EU Countries and to understand how it will evolve in the near future.

It will be very useful if you should give us your advice, together with the relevant documents, in your language, and possibly in English if you have provided a translation, regarding:

- a. Current structure of the legislation
- b. Relevant background of previous provisions
- c. Legal texts and practical regulations
- d. Recent innovations and possible near future provisions

### **2) THE CIVIL PROTECTION STRUCTURE**

Modern Civil Protection, in a modern, post-industrial society, has two major tasks: the first is sociological, in the sense that the new organisation has to deeply intermingle with the existing social institutions in order to gain consensus on possible restrictions of land use and other limitations; the second is technological, in the sense that Civil Protection must make use of the most advanced and efficient tools to predict, forecast and observe the effects of extreme events affecting people and their properties, in order for the Authority to be perceived as being as reliable as possible.

We would like to review the present structure of the organisation of Civil Protection in your country in terms of the following issues.

From the organisational point of view:

- a. Organisation: command and control chain;
- b. Personnel: an estimation of the number of people involved in so-called 'peace periods' and the structure of their technical qualifications;
- c. Personnel: an estimation of the number of people involved in 'emergency periods' and the structure of their technical qualifications;
- d. How the personnel are contracted, including how many depend directly on the Civil Protection organisation, and how many depend on other State or local organisations;
- e. How many of the personnel are contracted as public servants and how many as private contractors;
- f. A rough estimate of annual costs for personnel, technologies and equipment, emergency assets and average recovery costs;
- g. Transportation, communications and logistics during the emergency phase. Organisation and costs of emergency phase management. A summary of the emergencies recently faced will be very useful;
- h. Overall annual Civil Protection financial instruments.

From the point of risk management we would like to prepare a clear assessment of:

- a. University departments, research agencies and/or organisations working for Civil Protection in the field of data mining and reporting;
- b. Public or private companies producing: special hardware and software tools, models and methods for hazard mapping/assessment, vulnerability and capacity assessment, risk monitoring and risk mapping and operational deployment in the sub-sectors of:
  - i. Disaster prevention
  - ii. Mitigation
  - iii. Early warning
  - iv. Preparedness and response
- c. Annual costs of investments for a as well as for b, possibly divided per sub-sector.
- d. Annual maintenance costs for a as well as for b, possibly divided per sub-sector.

### **3) CIVIL PROTECTION AND SOCIETY**

In most EU Countries the System of Civil Protection is thought of as a way for the Government to achieve social consensus; this is a measure of how reliable the Government is, and how effectively it takes care of its citizens. Through Civil Protection, many people and charitable organisations volunteer their help in mitigating the impact of extreme events or responding to the Civil Protection call during emergencies, both domestically and in other countries; this is perceived as a way to achieve social coherence.

We would like to report, and also quantify from a financial perspective, about the experience of your country in:

- a. Cross-border and other international cooperative or collaborative actions, including exchange of experts: quantify the issue from the point of view of human resources devoted full-time to such actions and from the point of view of financial instruments;
- b. Training, and child education: quantify the issue including mention of: special undergraduate or graduate courses; continuing education programmes; primary school curriculum addressing disaster risk reduction; and initiatives bringing together younger and older generations to discuss disaster risk reduction;
- c. Simulation exercises: recent cross-border or international simulation exercises you joined; cross-border or international simulation exercises you are planning to join; and countries you would like to involve in cross-border or international simulation exercises;
- d. Research and Development activities: including university departments, research agencies and/or organisations working in the field of disaster risk reduction, their possible inclusion in an international research net and their eventual participation to EU-funded research or applied research projects;
- e. Interactions with the Community Mechanism for Civil Protection (CMCP): your participation in initiatives/ interventions in which the CMCP was involved; your possible request for assistance through the MIC (Monitoring and Information Centre) of the CMCP; and the need of your country to be included in training and exchange of experts organised by the CMCP;
- f. Your main objectives in the field of interactions with the CMCP;
- g. Collaborations and agreements with UN Agencies, EU DG-ENV Civil Protection, EU DG-Enlargement, EU-DG-ECHO and other institutional bodies in the field of Civil Protection: agreements already signed or in preparation; funds you have already received or to be received in the next future, and funds you are planning/ would like to receive and related planning activities.

## ANNEX 2

### *List of contacted organisations and institutions*

Country	Organisation/Institution
Albania	Ministry of Interior, Civil Emergency General Directorate
Bosnia and Herzegovina	Ministry of Security of BandH
Bulgaria	Ministry of State Policy for Disasters and Accidents
	State Agency for Civil Protection
Croatia	National Protection and Rescue Directorate
FYR of Macedonia	Crisis Management Centre Protection and Rescue Directorate
Italy	Italian Civil Protection Department of the Presidency of the Council of Ministers
	Italian Civil Protection Department of the Presidency of the Council of Ministers
Moldova	Civil Protection and Emergency Situations Service
	State Hydro-meteorological Service
Montenegro	Ministry of Interior and Public Administration
Romania	General Inspectorate for Emergency Situations
Serbia	Ministry of Interior, Protection and Rescue Sector
	Ministry of Defence, Civil Protection Department
Slovenia	Administration of the RS for Civil Protection and Disaster Relief
Sweden	Swedish Rescue Service Agency
Turkey	General Directorate of Civil Defence
	Ministry of Public Works and Settlement

## **ANNEX 3**

### *List of documents provided by contacted organisations and institutions*

#### **CROATIA**

Protection and Rescue Act, passed by the Croatian Parliament at its session on 26 November 2004. No. 01-081-04-3670/2. In English.

#### **MOLDOVA**

Law on Civil Protection (Official Gazette of Moldova, No. 20/1994). In Moldovan.

Law on Defence against Fires (Official Gazette of Moldova, No. 15/1995). In Moldovan.

Law on Radiation Protection and Safety (Official Gazette of Moldova, No. 98/2006). In Moldovan.

Lege cu privire la rechizițiile de bunuri și prestarile de servicii în interes public (Official Gazette of Moldova, No. 178/2002). In Moldovan.

Lege Serviciului Protecției Civile și Situațiilor Exceptionale (Official Gazette of Moldova, No. 78/2007). In Moldovan.

Lege privind administrația publică locală (Official Gazette of Moldova, No. 32/2007). In Moldovan.

Hotărâre cu privire la aprobarea Regulamentului rețelei naționale de observare și control de laborator asupra contaminării (poluării) mediului înconjurător cu substanțe radioactive, otrăvitoare, puternic toxice și agenți biologici (Official Gazette of Moldova, No. 142/2006). In Moldovan.

Hotărâre cu privire la modul de acumulare și schimb de informații în domeniul protecției populației și a teritoriului în condiii de situații excepționale (Official Gazette of Moldova, No. 380/2003). In Moldovan.

Hotărâre cu privire la aprobarea Concepției Sistemului Informațional Geografic al Departamentului Situațiilor Exceptionale (Official Gazette of Moldova, No. 199/2004). In Moldovan.

Hotărâre pentru aprobarea Regulamentului cu privire la organizarea sistemului de înștiințare și transmisiuni în caz de pericol sau de apariție a situațiilor excepționale (Official Gazette of Moldova, No. 139/2005). In Moldovan.

Hotărâre cu privire la Comisia pentru Situații Exceptionale a Republicii Moldova (Official Gazette of Moldova, No. 150/2001). In Moldovan.

Hotărâre cu privire la aprobarea Catalogului mijloacelor fixe și activelor nemateriale (Official Gazette of Moldova, No. 062/2003). In Moldovan.

#### **ROMANIA**

Report “Structura Protecției Civile din România: Rolul și atribuțiile în reducerea riscurilor de dezastre” General Inspectorate for Emergency Situations. In Romanian.

#### **SERBIA**

НАЦРТ ЗАКОНА О ЗАШТИТИ И СПАСАВАЊУ (Disegno di legge sulla Protezione Civile e sul salvataggio – Italian translation provided by Ms. J. Bogdanovic).

#### **SLOVENIA**

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C. Vittorini. Disaster Management System in Slovenia. *Obiettivo sicurezza*, anno 4 N. 5, pp 45-49. In Italian.

M. Dobnik Jeraj, M. Klarič. Disaster Management System in Slovenia. February 2006. In English.

M. Dobnik Jeraj, D. Napotnik. The institutional Framework of Crisis Management in Slovenia (part of the article). *CRISMART*, Vol. 26, Crisis Management in Slovenia, Stockholm 2004. In English.

Report on the implementation of the SEVESO II Directive. ? More detailed references missing

National report and information on disaster reduction for the World Conference on Disaster Reduction (Kobe-Hyogo, Japan, 18-22 January 2005), prepared by the Administration for Civil Protection and Disaster Relief – Ministry of Defence of the Republic of Slovenia. Updated April 2008. In English.

Protection Against Natural and Other Disasters Act (1994, renewed in 2006), Official Gazette of the Republic of Slovenia, 51/06. In English

## **SWEDEN**

International CEP Handbook 2006. Civil Emergency Planning in the NATO/EAPC Countries. SEMA's Educational Series 2006:1.

DG ENV. Member States' Approaches towards Prevention Policy - a Critical Analysis. Case Study Report – Sweden. Internal working document. January 2008.

Natural hazards - protection and prevention in Sweden. Memo by Barbro Näslund-Landenmark and Mette Lindahl Olsson. 20 December 2004.

Swedish Rescue Service Agency. Research for a Safer Society - Guidance document for research by the Swedish Rescue Services Agency.

Sweden facing climate change – threats and opportunities. *SOU 2007:60*. Final report from the Swedish Commission on Climate and Vulnerability. Stockholm 2007.

Swedish Rescue Service Agency. The Swedish Rescue Service Agency's work with natural disasters.

## ANNEX 4

### *UNISDR terminology*

#### **Terminology: Basic terms of disaster risk reduction**

The ISDR Secretariat presents these basic definitions on disaster risk reduction in order to promote a common understanding on this subject, for use by the public, authorities and practitioners. The terms are based on a broad consideration of different international sources.

This is a continuing effort to be reflected in future reviews, responding to a need expressed in several international venues, regional discussions and national commentary. Feedback from specialists and other practitioners to improve these definitions will be most welcome.

#### **Acceptable risk**

The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions.

*Comment: In engineering terms, acceptable risk is also used to assess and define the structural and non-structural measures that are needed in order to reduce possible harm to people, property, services and systems to a chosen tolerated level, according to codes or 'accepted practice' which are based on known probabilities of hazards and other factors.*

#### **Adaptation**

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

*Comment: This definition addresses the concerns of climate change and is sourced from the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC). The broader concept of adaptation also applies to non-climatic factors such as soil erosion or surface subsidence. Adaptation can occur in autonomous fashion, for example through market changes, or as a result of intentional adaptation policies and plans. Many disaster risk reduction measures can directly contribute to better adaptation.*

#### **Biological hazard**

Process or phenomenon of organic origin or conveyed by biological vectors, including exposure to pathogenic micro-organisms, toxins and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment: Examples of biological hazards include outbreaks of epidemic diseases, plant or animal contagion, insect or other animal plagues and infestations.*

#### **Building code**

A set of ordinances or regulations and associated standards intended to control aspects of the design, construction, materials, alteration and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.

*Comment: Building codes can include both technical and functional standards. They should incorporate the lessons of international experience and should be tailored to national and local circumstances. A systematic regime of enforcement is a critical supporting requirement for effective implementation of building codes.*

#### **Capacity**

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

*Comment: Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership and management. Capacity also may be described as capability. Capacity assessment is a term for the process by which the capacity of a group is reviewed against desired goals, and the capacity gaps are identified for further action.*

## Capacity Development

The process by which people, organisations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions.

*Comment: Capacity development is a concept that extends the term of capacity building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems, and the wider social and cultural enabling environment.*

## Climate change

(a) The Inter-governmental Panel on Climate Change (IPCC) defines climate change as: “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use”.

(b) The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”.

*Comment: For disaster risk reduction purposes, either of these definitions may be suitable, depending on the particular context. The UNFCCC definition is the more restricted one as it excludes climate changes attributable to natural causes. The IPCC definition can be paraphrased for popular communications as “A change in the climate that persists for decades or longer, arising from either natural causes or human activity.”*

## Contingency planning

A management process that analyses specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and situations.

*Comment: Contingency planning results in organised and coordinated courses of action with clearly-identified institutional roles and resources, information processes, and operational arrangements for specific actors at times of need. Based on scenarios of possible emergency conditions or disaster events, it allows key actors to envision, anticipate and solve problems that can arise during crises. Contingency planning is an important part of overall preparedness. Contingency plans need to be regularly updated and exercised.*

## Coping capacity

The ability of people, organisations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters.

*Comment: The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during crises or adverse conditions. Coping capacities contribute to the reduction of disaster risks.*

## Corrective disaster risk management \*

Management activities that address and seek to correct or reduce disaster risks which are already present.

*Comment: This concept aims to distinguish between the risks that are already present, and which need to be managed and reduced now, and the prospective risks that may develop in future if risk reduction policies are not put in place. See also Prospective risk management.*

## Critical facilities

The primary physical structures, technical facilities and systems which are socially, economically or operationally essential to the functioning of a society or community, both in routine circumstances and in the extreme circumstances of an emergency.

*Comment: Critical facilities are elements of the infrastructure that support essential services in a society. They include such things as transport systems, air and sea ports, electricity, water and communications systems, hospitals and health clinics, and centres for fire, police and public administration services.*

## Disaster

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

*Comment: Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are*

present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.

## Disaster risk

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

*Comment: The definition of disaster risk reflects the concept of disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socio-economic development, disaster risks can be assessed and mapped, in broad terms at least.*

## Disaster risk management

The systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

*Comment: This term is an extension of the more general term “risk management” to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.*

## Disaster risk reduction

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

*Comment: A comprehensive approach to reduce disaster risks is set out in the United Nations-endorsed Hyogo Framework for Action, adopted in 2005, whose expected outcome is “The substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries.” The International Strategy for Disaster Reduction (ISDR) system provides a vehicle for cooperation among Governments, organisations and civil society actors to assist in the implementation of the Framework. Note that while the term “disaster reduction” is sometimes used, the term “disaster risk reduction” provides a better recognition of the ongoing nature of disaster risks and the ongoing potential to reduce these risks.*

## Disaster risk reduction plan \*

A document prepared by an authority, sector, organisation or enterprise that sets out goals and specific objectives for reducing disaster risks together with related actions to accomplish these objectives.

*Comment: Disaster risk reduction plans should be guided by the Hyogo Framework and considered and coordinated within relevant development plans, resource allocations and programme activities. National level plans needs to be specific to each level of administrative responsibility and adapted to the different social and geographical circumstances that are present. The time frame and responsibilities for implementation and the sources of funding should be specified in the plan. Linkages to climate change adaptation plans should be made where possible.*

## Early-warning system

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

*Comment: This definition encompasses the range of factors necessary to achieve effective responses to warnings. A people-centred early warning system necessarily comprises four key elements: knowledge of the risks; monitoring, analysis and forecasting of the hazards; communication or dissemination of alerts and warnings; and local capabilities to respond to the warnings received. The expression “end-to-end warning system” is also used to emphasize that warning systems need to span all steps from hazard detection through to community response.*

## Ecosystem services

The benefits that people and communities obtain from ecosystems.

*Comment: This definition is drawn from the Millennium Ecosystem Assessment. The benefits that ecosystems can provide include “regulating*

services” such as regulation of floods, drought, land degradation and disease, along with “provisioning services” such as food and water; “supporting services” such as soil formation and nutrient cycling, and “cultural services” such as recreational, spiritual, religious and other non-material benefits. Integrated management of land, water and living resources that promotes conservation and sustainable use provide the basis for maintaining ecosystem services, including those that contribute to reduced disaster risks.

## El Niño-Southern Oscillation phenomenon

A complex interaction of the tropical Pacific Ocean and the global atmosphere that results in irregularly occurring episodes of changed ocean and weather patterns in many parts of the world, often with significant impacts over many months, such as altered marine habitats, rainfall changes, floods, droughts, and changes in storm patterns.

*Comment: The El Niño part of the El Niño-Southern Oscillation (ENSO) phenomenon refers to the well-above-average ocean temperatures that occur along the coasts of Ecuador, Peru and northern Chile and across the eastern equatorial Pacific Ocean, while La Niña part refers to the opposite circumstances when well-below-average ocean temperatures occur. The Southern Oscillation refers to the accompanying changes in the global air pressure patterns that are associated with the changed weather patterns experienced in different parts of the world.*

## Emergency management

The organisation and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.

*Comment: A crisis or emergency is a threatening condition that requires urgent action. Effective emergency action can avoid the escalation of an event into a disaster. Emergency management involves plans and institutional arrangements to engage and guide the efforts of government, non-government, voluntary and private agencies in comprehensive and coordinated ways to respond to the entire spectrum of emergency needs. The expression “disaster management” is sometimes used instead of emergency management.*

## Emergency services

The set of specialized agencies that have specific responsibilities and objectives in serving and protecting people and property in emergency situations.

*Comment: Emergency services include agencies such as civil protection authorities, police, fire, ambulance, paramedic and emergency medicine services, Red Cross and Red Crescent societies, and specialized emergency units of electricity, transportation, communications and other related services organisations.*

## Environmental degradation

The reduction of the capacity of the environment to meet social and ecological objectives and needs.

*Comment: Degradation of the environment can alter the frequency and intensity of natural hazards and increase the vulnerability of communities. The types of human-induced degradation are varied and include land misuse, soil erosion and loss, desertification, wildland fires, loss of biodiversity, deforestation, mangrove destruction, land, water and air pollution, climate change, sea level rise and ozone depletion.*

## Environmental impact assessment

Process by which the environmental consequences of a proposed project or programme are evaluated, undertaken as an integral part of planning and decision-making processes with a view to limiting or reducing the adverse impacts of the project or programme.

*Comment: Environmental impact assessment is a policy tool that provides evidence and analysis of environmental impacts of activities from conception to decision-making. It is utilized extensively in national programming and project approval processes and for international development assistance projects. Environmental impact assessments should include detailed risk assessments and provide alternatives, solutions or options to deal with identified problems.*

## Exposure

People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

*Comment: Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest.*

## Extensive risk \*

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

*Comment: Extensive risk is mainly a characteristic of rural areas and urban margins where communities are exposed to, and vulnerable to, recurring localised floods, landslides storms or drought. Extensive risk is often associated with poverty, urbanization and environmental degradation. See also 'Intensive risk'.*

## Forecast

Definite statement or statistical estimate of the likely occurrence of a future event or conditions for a specific area.

*Comment: In meteorology a forecast refers to a future condition, whereas a warning refers to a potentially dangerous future condition.*

## Geological hazard

Geological process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment: Geological hazards include internal earth processes, such as earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses, and debris or mud flows. Hydrometeorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize; although they are triggered by undersea earthquakes and other geological events, they are essentially an oceanic process that is manifested as a coastal water-related hazard.*

## Greenhouse gases

Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds.

*Comment: This is the definition of the Intergovernmental Panel on Climate Change (IPCC). The main greenhouse gases (GHG) are water vapour, carbon dioxide, nitrous oxide, methane and ozone.*

## Hazard

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

*Comment: The hazards of concern to disaster risk reduction as stated in footnote 3 of the Hyogo Framework are "... hazards of natural origin and related environmental and technological hazards and risks." Such hazards arise from a variety of geological, meteorological, hydrological, oceanic, biological, and technological sources, sometimes acting in combination. In technical settings, hazards are described quantitatively by the likely frequency of occurrence of different intensities for different areas, as determined from historical data or scientific analysis.*

*See other hazard-related terms in the Terminology: Biological hazard; Geological hazard; Hydrometeorological hazard; Natural hazard; Socio-natural hazard; Technological hazard.*

## Hydrometeorological hazard

Process or phenomenon of atmospheric, hydrological or oceanographic nature that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment: Hydrometeorological hazards include tropical cyclones (also known as typhoons and hurricanes), thunderstorms, hailstorms, tornados, blizzards, heavy snowfall, avalanches, coastal storm surges, floods including flash floods, drought, heatwaves and cold spells. Hydrometeorological conditions also can be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics, and in the transport and dispersal of toxic substances and volcanic eruption material.*

## Intensive risk \*

The risk associated with the exposure of large concentrations of people and economic activities to intense hazard events, which can lead to potentially catastrophic disaster impacts involving high mortality and asset loss.

*Comment: Intensive risk is mainly a characteristic of large cities or densely populated areas that are not only exposed to intense hazards such as strong earthquakes, active volcanoes, heavy floods, tsunamis, or major storms but also have high levels of vulnerability to these hazards. See also 'Extensive risk'.*

## Land-use planning

The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses.

*Comment: Land-use planning is an important contributor to sustainable development. It involves studies and mapping; analysis of economic, environmental and hazard data; formulation of alternative land-use decisions; and design of long-range plans for different geographical and administrative scales. Land-use planning can help to mitigate disasters and reduce risks by discouraging settlements and construction of key installations in hazard-prone areas, including consideration of service routes for transport, power, water, sewage and other critical facilities.*

## Mitigation

The lessening or limitation of the adverse impacts of hazards and related disasters.

*Comment: The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness. It should be noted that in climate change policy, “mitigation” is defined differently, being the term used for the reduction of greenhouse gas emissions that are the source of climate change.*

## National platform for disaster risk reduction

A generic term for national mechanisms for coordination and policy guidance on disaster risk reduction that are multi-sectoral and interdisciplinary in nature, with public, private and civil society participation involving all concerned entities within a country.

*Comment: This definition is derived from footnote 10 of the Hyogo Framework. Disaster risk reduction requires the knowledge, capacities and inputs of a wide range of sectors and organisations, including United Nations agencies present at the national level, as appropriate. Most sectors are affected directly or indirectly by disasters and many have specific responsibilities that impinge upon disaster risks. National platforms provide a means to enhance national action to reduce disaster risks, and they represent the national mechanism for the International Strategy for Disaster Reduction.*

## Natural hazard

Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment: Natural hazards are a sub-set of all hazards. The term is used to describe actual hazard events as well as the latent hazard conditions that may give rise to future events. Natural hazard events can be characterized by their magnitude or intensity, speed of onset, duration, and area of extent. For example, earthquakes have short durations and usually affect a relatively small region, whereas droughts are slow to develop and fade away and often affect large regions. In some cases hazards may be coupled, as in the flood caused by a hurricane or the tsunami that is created by an earthquake.*

## Preparedness

The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

*Comment: Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term “readiness” describes the ability to quickly and appropriately respond when required.*

## Prevention

The outright avoidance of adverse impacts of hazards and related disasters.

*Comment: Prevention (i.e. disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake. Very often the complete avoidance of losses is not feasible and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.*

## Prospective disaster risk management \*

Management activities that address and seek to avoid the development of new or increased disaster risks.

*Comment: This concept focuses on addressing risks that may develop in future if risk reduction policies are not put in place, rather than on the risks that are already present and which can be managed and reduced now. See also Corrective disaster risk management.*

## Public awareness

The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards.

*Comment: Public awareness is a key factor in effective disaster risk reduction. Its development is pursued, for example, through the development and dissemination of information through media and educational channels, the establishment of information centres, networks, and community or participation actions, and advocacy by senior public officials and community leaders.*

## Recovery

The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

*Comment: The recovery task of rehabilitation and reconstruction begins soon after the emergency phase has ended, and should be based on pre-existing strategies and policies that facilitate clear institutional responsibilities for recovery action and enable public participation. Recovery programmes, coupled with the heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement disaster risk reduction measures and to apply the 'build back better' principle.*

## Residual risk

The risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained.

*Comment: The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery together with socio-economic policies such as safety nets and risk transfer mechanisms.*

## Resilience

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

*Comment: Resilience means the ability to 'resile from' or 'spring back from' a shock. The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organizing itself both prior to and during times of need.*

## Response

The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

*Comment: Disaster response is predominantly focused on immediate and short-term needs and is sometimes called "disaster relief". The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage.*

## Retrofitting

Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.

*Comment: Retrofitting requires consideration of the design and function of the structure, the stresses that the structure may be subject to from particular hazards or hazard scenarios, and the practicality and costs of different retrofitting options. Examples of retrofitting include adding bracing to stiffen walls, reinforcing pillars, adding steel ties between walls and roofs, installing shutters on windows, and improving the protection of important facilities and equipment.*



## Risk

The combination of the probability of an event and its negative consequences.

*Comment: This definition closely follows the definition of the ISO/IEC Guide 73. The word “risk” has two distinctive connotations: in popular usage the emphasis is usually placed on the concept of chance or possibility, such as in “the risk of an accident”; whereas in technical settings the emphasis is usually placed on the consequences, in terms of “potential losses” for some particular cause, place and period. It can be noted that people do not necessarily share the same perceptions of the significance and underlying causes of different risks.*

*See other risk-related terms in the Terminology: Acceptable risk; Corrective disaster risk management; Disaster risk; Disaster risk management; Disaster risk reduction; Disaster risk reduction plans; Extensive risk; Intensive risk; Prospective disaster risk management; Residual risk; Risk assessment; Risk management; Risk transfer.*

## Risk assessment

A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

*Comment: Risk assessments (and associated risk mapping) include: a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability including the physical social, health, economic and environmental dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios. This series of activities is sometimes known as a risk analysis process.*

## Risk management

The systematic approach and practice of managing uncertainty to minimize potential harm and loss.

*Comment: Risk management comprises risk assessment and analysis, and the implementation of strategies and specific actions to control, reduce and transfer risks. It is widely practiced by organisations to minimise risk in investment decisions and to address operational risks such as those of business disruption, production failure, environmental damage, social impacts and damage from fire and natural hazards. Risk management is a core issue for sectors such as water supply, energy and agriculture whose production is directly affected by extremes of weather and climate.*

## Risk transfer

The process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party.

*Comment: Insurance is a well-known form of risk transfer, where coverage of a risk is obtained from an insurer in exchange for ongoing premiums paid to the insurer. Risk transfer can occur informally within family and community networks where there are reciprocal expectations of mutual aid by means of gifts or credit, as well as formally where governments, insurers, multi-lateral banks and other large risk-bearing entities establish mechanisms to help cope with losses in major events. Such mechanisms include insurance and re-insurance contracts, catastrophe bonds, contingent credit facilities and reserve funds, where the costs are covered by premiums, investor contributions, interest rates and past savings, respectively.*

## Socio-natural hazard \*

The phenomenon of increased occurrence of certain geophysical and hydrometeorological hazard events, such as landslides, flooding, land subsidence and drought, that arise from the interaction of natural hazards with overexploited or degraded land and environmental resources.

*Comment: This term is used for the circumstances where human activity is increasing the occurrence of certain hazards beyond their natural probabilities. Evidence points to a growing disaster burden from such hazards. Socio-natural hazards can be reduced and avoided through wise management of land and environmental resources.*

## Structural and non-structural measures

Structural measures: Any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques to achieve hazard-resistance and resilience in structures or systems;

Non-structural measures: Any measure not involving physical construction that uses knowledge, practice or agreement to reduce risks and impacts, in particular through policies and laws, public awareness raising, training and education.

*Comment: Common structural measures for disaster risk reduction include dams, flood levies, ocean wave barriers, earthquake-resistant construction, and evacuation shelters. Common non-structural measures include building codes, land use planning laws and their enforcement, research and assessment, information resources, and public awareness programmes. Note that in civil and structural engineering, the term 'structural' is used in a more restricted sense to mean just the load-bearing structure, with other parts such as wall cladding and interior fittings being termed non-structural.*

## **Sustainable development**

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

*Comment: This definition coined by the 1987 Brundtland Commission is very succinct but it leaves unanswered many questions regarding the meaning of the word development and the social, economic and environmental processes involved. Disaster risk is associated with unsustainable elements of development such as environmental degradation, while conversely disaster risk reduction can contribute to the achievement of sustainable development, through reduced losses and improved development practices.*

## **Technological hazard**

A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment: Examples of technological hazards include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires, and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.*

## **Vulnerability**

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

*Comment: There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. Vulnerability varies significantly within a community and over time. This definition identifies vulnerability as a characteristic of the element of interest (community, system or asset) which is independent of its exposure. However, in common use the word is often used more broadly to include the element's exposure.*

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\* Emerging new concepts that are not in widespread use but are of growing professional relevance; the definition of these terms remain to be widely consulted upon and may change in future.

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