UNISDR
The United Nations Office for Disaster Risk Reduction

WMO

Building Resilience to Disaster in Western Balkans and Turkey

A compendium of disaster risk reduction practices in cities of the Western Balkans and Turkey:

A REVIEW OF SELECTED CITIES PARTICIPATING IN UNISDR'S 'MAKING CITIES RESILIENT: MY CITY IS GETTING READY!' CAMPAIGN

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AFAD	Disaster and Emergency Management Presidency
BiH	Bosnia and Herzegovina
CRIF	Catastrophe Risk Insurance Facility
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
EC	European Commission
EU	European Union
FBiH	Federation of Bosnia and Herzegovina
FSRY	Former Socialist Republic of Yugoslavia
FYRoM	The former Yugoslav Republic of Macedonia
GADSEP	Gaziantep Earthquake Strategy and Action Plan
GAP	South-Eastern Anatolia Project
GDP	Gross Domestic Product
HFA	Hyogo Framework of Action
IFRC	International Federation of Red Cross
IPA	Pre-Accession Assistance
IPCC	Intergovernmental Panel on Climate Change
ISOCARP	International Society of City and Regional Planners
LGSAT	Local Government Self-Assessment Tool
MCS	Mercalli-Cancani-Sieberg
MUDP	Municipality Urban Development Plan
NGO	Non-Governmental Organization
NPDRR	National Platform for Disaster Risk Reduction
PDNA	Post-Disaster Needs Assessment
RS	Republika Srpska
SEE	South Eastern Europe
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN-HABITAT	United Nations Human Settlements Programme
UNISDR	United Nations Office for Disaster Risk Reduction
US	United States
USAID	United States Agency for International Development
WB	World Bank
WMO	World Meteorological Organization

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Executive Summary

In May 2012, the United Nations Office for Disaster Risk Reduction (UNISDR) and World Meteorological Organization (WMO) initiated the 'Building Resilience to Disasters in Western Balkans and Turkey' project, with the support of the European Commission (DG Enlargement) under the instrument for Pre-Accession Assistance (IPA), with an objective to build the resilience of IPA beneficiaries in South Eastern Europe (SEE).

This compendium was undertaken as part of the 8th Task of this project, with a goal to enhance the knowledge of local government officials and local decision-makers on disaster risk reduction (DRR) and to showcase good practices on urban DRR in cities of the Western Balkans and Turkey. The compendium built upon UNISDR's 'Making Cities Resilient: My City is Getting Ready!' campaign in collecting urban risk reduction experiences of the selected cities of the IPA beneficiary countries in the project which have participated in the Campaign.

Through interviews with local officials, surveys with local decision-makers, and secondary research of existing materials this compendium compiled urban risk reduction policies and activities in Tirana, Albania; Sarajevo Centar, Bosnia and Herzegovina (BiH); Dubrovnik, Croatia; Pristina, Kosovo*; Strumica, the former Yugoslav Republic of Macedonia (FYRoM); Cetinje, Montenegro; Niš, Serbia; and Gaziantep, Turkey.

Through the eight city case studies, the compendium examined hazards and the impacts of climate change affecting the cities of the Western Balkans and Turkey. It also analyzed institutional, financial and legal structures that the local authorities in urban areas of the region possess for their DRR and disaster risk management (DRM) activities. The case studies further observed whether the examined cities have disaster risk assessment and risk plans and in what ways they perform urban risk reduction and resilience-building activities.

The analysis and observations in this compendium demonstrate that the cities of the Western Balkans and Turkey are prone to multiple hazards such as floods, earthquakes, intense rain, heavy snow, landslides, fires and storms, some of which may intensify with climate change. Due to inherent socio-economic and spatial vulnerabilities and inadequate institutional capacities, cities in the region are susceptible to major disasters that may initiate from these hazards.

While the institutions and regulations related to DRR and DRM activities by local authorities are being restructured, challenges seem to arise from coordination between municipal departments and their limited collaboration. One of the respondents further indicated that a major problem was the "competence" of involved actors. In particular, most of the cities in this compendium acknowledge that inadequate technical and financial capacity for DRR and DRM practices is the biggest challenge that the local authorities responsible for these practices have.

Furthermore, definition of risk and sound risk assessments that include the study of multiple hazards and socio-economic and spatial vulnerabilities are rare, limiting risk reduction measures to mostly structural measures. Land-use control and building regulations are the two most-used risk reduction strategies by the cities. However, so far only a limited number of cities have incorporated hazard information into their land-use plans. In many cities, spontaneous urbanization and the lack of compliance with building and land-use regulations are major challenges that increase vulnerability and inhibit the implementation of risk reduction measures.

There are other DRR actions that are being used in urban areas of the region. They include: structural update of critical infrastructure; availability of catastrophe insurance in many nations; earthquake-resistant retrofitting of schools; emergency plans and emergency shelters; protection of ecosystems and rational energy management or renewable energy uses for climate change; early warning systems and public awareness campaigns; and education of school children and technical staff in municipalities, although the level of use of these measures varies in each city. Deficiencies in infrastructure exist throughout the region and there is room for further improvement in public awareness of hazards and public-participation in the decision-making process.

Despite challenges, this compendium shows that there are many good practices in the region. Cities in the Western Balkans and Turkey have started to channel the information on hazards to risk plans and DRR activities. However, local authorities need to be further supported by technical and financial capacities. Concise identification of risks, entailing enhanced micro-level data, will better define and extend the type of risk reduction and resilience-building activities that are being used by local authorities. Horizontal coordination between departments in local authorities and vertical coordination between local, regional and national authorities and their development and planning agendas are essential. Furthermore, local authorities need to include a bottom-up approach, by way of involving community organizations and vulnerable groups into the decision-making process, which will ensure implementation of DRR actions.

Some of the local authorities in this compendium have taken innovative approaches to increase their technical and financial capacities by collaborating with other cities, as well as with private organizations or civil-society associations. Such models could be further employed by other cities in the region. The close proximity of countries and cities in the Western Balkans and Turkey, and the trans-boundary character of hazards there, could represent opportunities rather than obstacles for the cities of the region. The good practices in this compendium could be employed by other cities in the region, with city-to-city exchanges and increased collaboration helping to enhance the success of urban risk reduction and resilience building in urban areas.

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1. Introduction: 'Building Resilience to Disasters in Western Balkans and Turkey' project

In May 2012, the United Nations Office for Disaster Risk Reduction and World Meteorological Organization started the project Building Resilience to Disasters in Western Balkans and Turkey, with the support of the European Commission (DG Enlargement) under the instrument for Pre-Accession Assistance. The overall objective of the project is to build the resilience of IPA beneficiaries in South Eastern Europe: Albania, Bosnia and Herzegovina, Croatia, Kosovo*, the former Yugoslav Republic of Macedonia, Montenegro, Serbia and Turkey. The project builds upon the results of previous interventions carried out by international organizations such as UNISDR, WMO, the United Nations Development Programme (UNDP) (with IPA Support) and the World Bank (WB).

The Project activities are structured in eight tasks, four of them being led by UNISDR and the other four being led by WMO. These tasks are:

1. Enhance regional institutional capacity and coordination with respect to disaster risk reduction and adaptation to climate change (UNISDR);
2. Strengthen regional capacity and cooperation towards data- and knowledge-sharing on risks (UNISDR);
3. Enhance regional risk assessment and mapping capacities through improved capacity of beneficiaries in hazard analysis and mapping (WMO);
4. Enhance IPA beneficiaries' capacity to forecast hazardous meteorological and hydrological phenomena and deliver timely warnings to support DRR (WMO);
5. Develop the capacity needed to support climate risk management and climate change adaptation into a national and regional disaster risk reduction agenda (WMO);
6. Design a regional Multi-Hazard Early Warning System composed of harmonized national Early Warning Systems within a regional cooperation framework (WMO);
7. Promote insurance and reinsurance products for disaster risk transfer among the IPA beneficiaries in collaboration with the private sector, the World Bank, the Europe Re and the South Eastern Europe and Caucasus Catastrophe Risk Insurance Facility (UNISDR); and
8. Increase public awareness in relation to disaster risk reduction (UNISDR).

This compendium is undertaken as part of the 8th Task of the Building Resilience to Disasters in Western Balkans and Turkey project, with a goal to enhance the knowledge of local government officials and local decision-makers on DRR and to showcase good practices on urban DRR in cities of the Western Balkans and Turkey. It builds upon UNISDR's Making Cities Resilient campaign in collecting urban risk reduction experiences of the selected cities, which have participated in the World Disaster Reduction Campaign.

Box 1: Making Cities Resilient: My City is Getting Ready! campaign

UNISDR launched the Making Cities Resilient: My City is Getting Ready! campaign in May 2010 "to support sustainable urban development by promoting resilience activities and increasing local-level understandings of risk" (UNISDR 2013, 3). The Campaign is guided by three central themes: to Know More, Invest Wiser and Build Safer, as outlined in the 'Ten Essentials for Making Cities Resilient,' and developed in line with the Five Priorities of the Hyogo Framework for Action (HFA) 2005-2015. The Ten Essentials Checklist is supported by the Handbook for Local Government Leaders and the Local Government Self-Assessment Tool (LGSAT). Furthermore, as part of the Campaign a Disaster Resilience Scorecard has been developed by IBM and AECOM to measure cities' resilience.

By signing up to the Campaign, local governments commit to leading their risk reduction activities on the basis of the Ten Essentials. As of September 2014, over 2,000 cities have committed to this campaign, of which 66 are from the countries of the IPA beneficiaries in the South Eastern Europe region.

The Campaign suggests to city leaders that they consider an incremental approach to prioritize disaster risk reduction to support other prevention and safety agendas, such as road or citizen safety, water-resource management, or climate adaptation. In addition, by using tools such as the LGSAT or the Disaster Resilience Scorecard, cities can measure their degree of resilience and focus on the actions that need to be further improved.

1.1. Methodology for this compendium

This compendium is based primarily on interviews, survey results and secondary research on national and urban risk reduction policies and activities of the selected cities of the IPA countries.

Secondary research is based on a review of existing material, reports and information available primarily through UNISDR and its partners, as well as local city reports and websites.

A questionnaire based on the compendium task, which relied on the Ten Essentials of the Making Cities Resilient campaign, was prepared and shared with partners based in selected cities of the IPA countries. The cities are: Tirana, Albania; Sarajevo Centar, Bosnia and Herzegovina; Dubrovnik, Croatia; Pristina, Kosovo*; Strumica, the former Yugoslav Republic of

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Macedonia; Cetinje, Montenegro; Niš, Serbia; and Gaziantep, Turkey. Interviews with local city officials were carried out via tele-conferencing based on this questionnaire.

Additionally, a web-based survey based on both open- and closed-ended questions was developed based on the Ten Essentials and the Disaster Resilience Scorecard of the Making Cities Resilient campaign. This survey was sent to the partners in the above-mentioned cities and was completed by multiple actors related to disaster risk reduction and resilience building in the associated cities.

Data collected through secondary research, interviews and surveys were analyzed to develop this compendium on urban risk reduction activities of the selected cities of the IPA countries. It should be noted that interviews were successfully conducted in only six cities: Tirana, Dubrovnik, Pristina, Strumica, Cetinje and Gaziantep. Due to the unprecedented flooding events that took place during the interviewing phase of this compendium, interview results were received only as written responses from Sarajevo Centar and Niš, eliminating the two-way communication with these two cities. Surveys were fully completed by only Dubrovnik and Gaziantep, and partially completed by other cities (except Sarajevo Centar and Niš).

These problems caused the compendium author to rely mostly on interviews and secondary research material. The author suggests that the surveys are used to gather follow-up information from the cities of the IPA countries that are currently transforming their national and local risk reduction policies, in order to observe the success of the newly established policies and institutional mechanisms in the implementation of urban risk reduction and resilience building.

Box 2: May 2014 Flood Disaster in Bosnia and Herzegovina and Serbia

In May 2014, Bosnia and Herzegovina and Serbia were affected by cyclone Tamara and experienced extremely heavy rain, strong winds and low temperatures (ACAPS 2014). Floods also affected neighbouring Croatia and the region recorded three months' worth of rain in three days (Weather Channel May 17, 2014). Pronounced as "the worst flooding since records began, 120 years ago," in BiH, one quarter of the country's population was directly affected by the floods (UNISDR ROE, 2014). Landslides and debris caused a challenge in recovery, along with the contamination of the water-supply system that posed a potential health threat (UN Office BiH 2014). Furthermore, reminiscent of the Balkan Conflict of the 1990s, 70 per cent of the flood-affected area is suspected of containing landmines, and mine-awareness signs might have either been moved or washed away – increasing the risk to the current mine maps' accuracy (ibid.) as an indicator of the region's complexities.

1.2. Outline of this compendium

This introductory section presents an overview of the compendium. It provides a background to the compendium and outlines research design and methods. The second section of the report gives an overview of hazards, vulnerability and exposure in the Western Balkans and Turkey region. The third section presents the core of the research in this compendium and presents the analysis of interviews and surveys undertaken by officials in charge of disaster risk reduction in selected cities of the IPA countries in the Western Balkans and Turkey. The fourth and last section brings together the discussions and research results presented in this work. As a summary and conclusion, it provides an overview and presents recommendations for building resilience to disasters in cities of the Western Balkans and Turkey.

2. Hazards, exposure and vulnerability in the Western Balkans and Turkey: an overview

The Western Balkans and Turkey are highly prone to natural hazards and to the impacts of climate change. Furthermore, within the last 15 years most of the nations in the region newly gained their independence following a regional conflict and have undergone major structural changes. The newly independent nations and their urban areas sustain inadequate institutional capacities and have significant socio-economic and spatial vulnerabilities, increasing their risk to disasters initiated by natural hazards and the impacts of climate change.

This section starts by providing an overview of natural hazards affecting the Western Balkans and Turkey region and then continues by discussing exposure and vulnerability that increases risk to disasters in the region.

2.1. Hazards in the Western Balkans and Turkey

The small size of the countries and the trans-boundary nature of the geologic and hydrological elements make disaster risk reduction and disaster risk management a regional problem in SEE, and in particular in the Western Balkans. For instance, "[b]oth the Mediterranean-Transasian seismic belt in the Balkan region and the Vranca seismic belt extend beyond any one single country" in the region, and the Sava River passes through several nations making it "difficult to respond to hazards at a country level" (UNISDR 2008, 41-42).

The SEE region is one of the major seismically active zones in Europe. Additionally, all countries in the SEE region face high risk due to floods. Landslides are another type of major hazard affecting the region, in particular Albania, Bosnia and Herzegovina and Montenegro due to "unplanned land use, forest and mineral resource exploitation, heavy rains, and change of water and land regimes" (ibid., 45-46). Drought and drought-related hazards, extreme temperatures, windstorms and wildfires are other important hazards affecting countries of the region.

Climate change is also expected to increasingly affect adversely the SEE region. Indeed, according to the 5th Report of the Inter-governmental Panel on Climate Change (IPCC) there is medium confidence that "climate change is expected to impede economic activity in Southern Europe more than in other sub-regions" and low confidence that it may also cause "future intra-regional disparity" (Kovats, S. and R. Valentini 2014, 3).

Overall, there is high confidence that "Southern Europe is particularly vulnerable to climate change as multiple sectors will be adversely affected (tourism, agriculture, forestry, infrastructure, energy, population health)" (ibid.).

South Eastern Europe is projected to become much drier and warmer, with a higher risk of drought and negative consequences for agriculture and water supply. Heat-waves, combined with drought, are expected to trigger massive forest fires (UNISDR and WB 2008, 3). With "expected temperature rises of 4-5 ^{0}C throughout Southern and South Eastern Europe, the yearly rainfall is expected to drop by up to 40 per cent of current annual precipitation[1], and the frequency of droughts and the economic changes caused by them could become even more pronounced" (ibid., 5). This increased intensity and severity of natural hazards and the increasing impacts of climate change is expected to have a "significant impact on the SEE countries' fiscal stability, households and businesses" (ibid., 6), increasing further the necessity of effective disaster risk reduction and resilience-building strategies in the region.

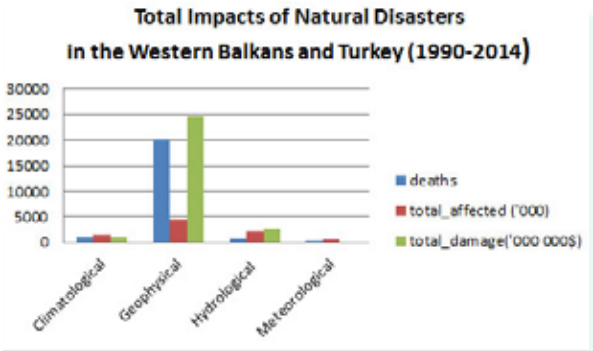
2.2. Exposure and vulnerability in the Western Balkans and Turkey

Since the late 1990s, the cities of the Western Balkans and Turkey, and particularly those in the nations that were part of the 1990s' conflict in the Balkans, have experienced a major transformation that has increased the region's vulnerability to hazards. According to a UNISDR (2008, 26) report: "the transition from centrally planned to market economics; historic national and regional conflicts; the creation of new nations; political tensions and war," and "rapid and unplanned land-use changes" have formed the common vulnerability characteristics of the region, which is already highly prone to earthquakes and hydro-meteorological hazards.

The growing rate of urbanization in the region has been influenced by population growth and a changing legal, social and economic environment following the disintegration of the former Socialist Republic of Yugoslavia (FSRY) and the transition of the countries in the region from centrally-planned to market-driven economies.

This rapid urbanization spurred informal settlements, particularly in and around the capital cities of the newly formed nations. Together with "an unprecedented boom in construction, which is inadequately managed and regulated," (UNDP and EC 2013, 23), deteriorated or war-damaged infrastructure, unsafe land-use practices, spatial and structural vulnerability to natural hazards and the impacts of climate change have increased incrementally in the region's urban areas.

Box 3: Impacts of Disasters Caused by Natural Hazards in the Western Balkans and Turkey (1990-2014)



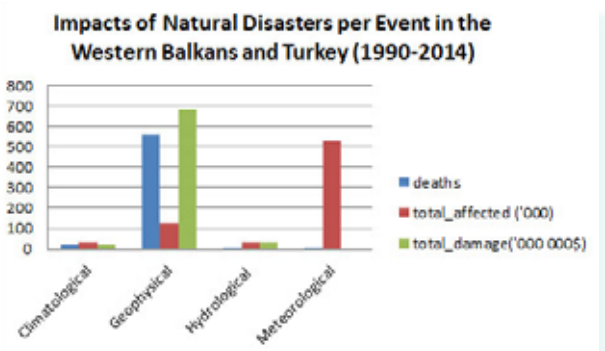


Fig 2.1. Total impacts of disasters caused by natural hazards in the Western Balkans and Turkey (1990-2014)
Fig.2.2. Impacts of disasters caused by natural hazards in the Western Balkans and Turkey (1990-2014)
Source: *Raw data collected from EM-DAT: The OFDA/CRED International Disaster Database. Brussels, Belgium: Université Catholique de Louvain, Center for Research on the Epidemiology of Disasters (CRED); <http://www.em-dat.net> (2014).*

From 1990 to 2014, there were 81 hydrological (flood, wet mass movement), 49 climatological (extreme temperature, drought, wildfire), 36 geophysical (earthquake, volcano, dry mass movement), and 13 meteorological (storm) disasters in the Western Balkans and Turkey. Despite lower numbers, geophysical hazards caused the highest number of casualties, total affected and total damage in the region, in particular due to the devastating 1999 Marmara Earthquakes, which impacted a highly urbanized area in Turkey. Similarly, meteorological hazards caused the highest total affected population per event in the Western Balkans and Turkey, directing attention to coastal and mountainous area settlements in the region.

1 Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Adapting to Climate Change in Europe – Options for EU Action; European Commission; 29 June 2007.

Box 4: Rate of Change and Level of Urbanization (2000 – 2030) in Europe and the SEE Countries (Estimates and Projections)

	2000 – 2010 Rate of Change (%)	2010-2020 Rate of Change (%)	2000 – 2030 Rate of Change (%)		2000 Level of Urbanization (LoU)	2010 (LoU)	2010 (LoU)	2010 (LoU)
Europe	0.26	0.30	0.32	Europe	70.08	72.7	74.9	77.4
Albania	2.26	1.73	1.05	Albania	41.7	52.3	62.2	69.1
Bosnia and Herzegovina	1.04	1.09	0.98	Bosnia and Herzegovina	43.0	47.7	53.2	58.7
Croatia	0.34	0.54	0.65	Croatia	55.6	57.5	60.7	64.8
The former Yugoslav Republic of Macedonia	-0.03	0.29	0.56	The former Yugoslav Republic of Macedonia	59.4	59.2	60.9	64.5
Montenegro	0.75	0.33	0.42	Montenegro	58.5	63.1	65.2	68.0
Serbia	0.56	0.62	0.66	Serbia	53.0	56.0	59.6	63.7
Turkey	0.85	1.09	0.56	Turkey	64.7	70.5	78.6	83.1

Table 2.1. Rate of change and level of urbanization (2000-2030) in Europe and the SEE Countries (Estimates and Projections)
Source: *Planning and Design for Sustainable Urban Mobility: Global Report on Human Settlements 2013 (UN-Habitat 2013, 229-230)*

Estimates and projections indicate a rapid rate of urbanization in SEE countries, with the exception of FYRoM, over the period 2000 to 2030. Despite this rapid urbanization, the levels of urbanization in SEE nations are still lower than the European average, with the exception of Turkey – which has undergone rapid urbanization in its large urban areas since the 1980s. Indeed, the level of urbanization in Turkey is expected to exceed that of Europe within a decade, indicating the need for resilience-building policies in this nation.

High rates of poverty and unemployment, societal vulnerability of minorities, and gender and income disparities, particularly in urban areas, add to the socio-economic vulnerability in the Western Balkans and Turkey (ibid., 25). It has also been reported that even though institutional arrangements are being made to improve spatial and municipal planning in the Western Balkans, "disaster risks are not sufficiently accounted for," further increasing the challenge of disaster risk reduction, resilience building and sustainable urban development in the cities of the region.

3. Disaster Risk Reduction and Resilience-Building practices in selected cities of the Western Balkans and Turkey

This section presents the research, interview and survey results related to disaster risk reduction and resilience-building activities in selected cities of the Western Balkans and Turkey. Each sub-section presents the research in a city of an IPA country: Tirana in Albania; Sarajevo Centar in Bosnia and Herzegovina; Dubrovnik in Croatia; Pristina in Kosovo*; Strumica in the former Yugoslav Republic of Macedonia; Cetinje in Montenegro; Niš in Serbia; and Gaziantep in Turkey.

The sub-sections start with a brief urban, hazard and risk profile and they continue with an overview of national institutional and legal systems, including that of budgetary systems, which provide mandate and delegate responsibilities and authorities for DRR and DRM activities to local governments. Particularly, they discuss how such mandate is implemented in cities of the region.

The sub-sections continue by discussing risk assessment and risk plans in the selected cities, and explores urban risk reduction and resilience-building activities. The sub-sections end by discussing good practices and challenges in the selected cities and providing recommendations for the enhancement of disaster risk reduction and resilience building in the region.

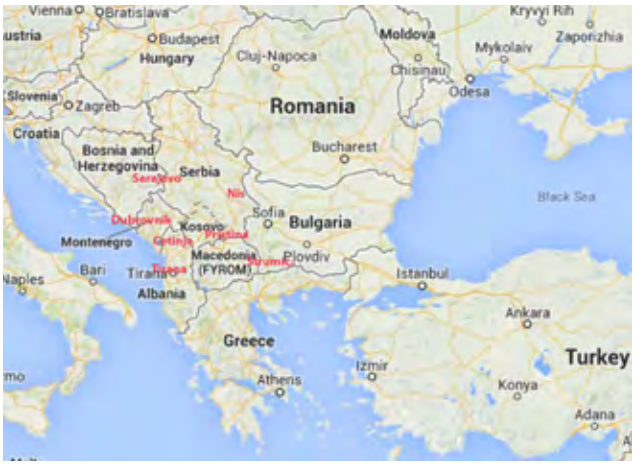


Figure 3.1. Selected cities of the Western Balkans and Turkey featured in the Compendium. *Author's adaptation from Google Maps (Courtesy of Google Maps)*

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3.1. TIRANA, ALBANIA

3.1.1 The City Profile

Fig. 3.2. City of Tirana *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Tirana is the capital and the largest city of Albania. Located in the central part of Albania, Tirana has an area of 42 km^2 and a population of 622,202, as of 2012 (City of Tirana). The City of Tirana contributes 36 per cent of Albania's National Gross Domestic Product (GDP). The Municipality of Tirana is divided into 11 municipal units, each with its own Mayor and Council.

3.1.2. Hazard and Risk Profile

Floods, earthquakes, storms (strong winds, intense rainfall in a short time), fires and landslides are the most common hazards affecting Tirana.

Floods

Tirana has two small rivers: Tirana River and Lana River Stream, as well as an artificial lake (Lake of Tirana).

With the rapid urbanization of Tirana after 1990, the Tirana River bed has narrowed in some areas due to illegal constructions and the disposal of solid waste. In 2013, 492 housing units were flooded following heavy rainfall. Due to waste disposal and collection of alluvium, parts of Lana Stream have also narrowed, creating risks in cases of heavy rainfall.

The Artificial Lake of Tirana was built in the southwest side of the City's Grand Park. The area under the lake's dam is very populated, especially after the urbanization of the 1990s, which damaged the sewerage network. At times of heavy rainfall, problems arise such as flooding of the streets, yards and ground floors.

The biggest emergency situation was recorded in September 2002, when the floodgates of the artifical lake dam were opened and it could not be closed due to a defect. As a result, about 200 flats, mostly those located on ground floors, were flooded.

Earthquakes

Tirana is highly prone to earthquakes as Albania lies on an active seismic fault. Within the last two decades, the uncontrolled movement of the population and rapid construction without the implementation of building codes and standards have led to an increased risk to Tirana's population from earthquake hazards.

In the cental parts of the Municipality of Tirana, building heights range from 25 to 30 floors. Furthermore, there have been many interventions to the basements or ground floors of buildings built prior to 1990, changing the structural integrity of buildings and making them more susceptible to earthquakes.

Intense Rainfall with Strong Winds

Tirana is highly susceptible to rapid and frequent weather changes that occur in short periods of time. There have been many recorded cases of sudden storms and winds and high intensity rainfall that occur within a short time, accumulating unsustainable water from the sewerage network of existing collectors and causing flooding, mostly of roads and basements.

Over recent years, Tirana has experienced such high intensity sudden rainfall in August 2010; in October 2012, for about 7 hours with 84 mm of precipitation; and in December 2012, for about 6 hours with 76 mm of precipitation, causing floods in various parts of the city.

Fires

During the last two decades, forest fires in Albania have increased in number and size. The main causes of these fires are public negligence, the burning of trees for pasture or for diversion of property, or by natural causes.

In the territory administred by the Municipality of Tirana, the presence of massive fires has been minimal. However, in the territory around the Municipality, particularly in the surrounding forests, there have been fire events. The largest fire event, which lasted for the greatest duration of about two weeks, occurred in 1993 in the National Park of Dajti Mountain and caused siginificant damage, destroying dozens of hectares of forest.

Mudslides and Landslides

Albania has massive instability of land, causing landslides. Causes include the mechanical action of surface and ground water, precipitation, seismic action, building interventions on slopes, construction of dams and large water catchment, the building of roads, tunnels and other infrastructure, and indiscriminate deforestation.

Due to its geographical position and geological condition, Ti-

rana is not heavily influenced by landslides. However, sporadic cases were identified due to constructions in informal settlements on the outskirts, and mainly along the sloped hills in the south eastern part of the city, causing several house collapses.

3.1.3 Institutional Capacity for DRR and DRM

Albania is a republic composed of 12 counties, 36 districts, municipalities and communes (ISOCARP 2008). The institutional transformation that has been taking place in Albania in the last 15 years has also affected legislation and institutional development related to disaster risk management, which is in the process of decentralizing. Albania does not yet have a National Platform for Disaster Risk Reduction (NPDRR).

In 2001, Law n. 8756 was adopted to establish a more modern civil protection system that recognized the Government as the first actor in civil emergencies. According to a revision of this Law, at the local level prefects (districts) represent the Department of Civil Emergency, Planning and Response of the Ministry of Internal Affairs. Prefects are accountable for civil protection in counties and districts. Mayors are responsible for planning and responding to civil emergencies in their respective municipalities. Commissions of Planning and Responding to Civil Emergencies are to be established in local governments under the chairmanship of the Mayors. These local Commissions are responsible for the coordination of all activities of the local government units and voluntary organizations, and for planning and responding to emergencies (Republic of Albania 2013).

Institutional capacities available in the Municipality of Tirana related to emergency situations are subject to the abovementioned Law n. 8756 and the Civil Emergencies Commission. Additionally, in case of a disaster emergency operations include the activation and support of the operational forces and the local non-governmental organizations (NGOs). Furthermore, when emergency cases are declared the Municipality is required to ask for the cooperation and assistance of the neighbouring states through an official request by the head of the institution.

At the international level, Tirana has joined UNISDR's Making Cities Resilient campaign. Tirana has also many twin cities, including in Europe: Ankara, Athens, Barcelona, Brussels, Bucharest, Bursa, Florence, Genoa, Kiev, Madrid, Marseille, Moscow, Paris, Prague, Pristina, Podgorica, Prizren, Rome, Sofia, Stockholm, Turin, Ulcinj, Vilnius, Zagreb and Zaragoza.

3.1.3.1. Budget

There are four types of budgetary provision for emergency issues in Albania, including related to local authorities: the 'Emergency Budget of the Ministry of Local Government and Decentralization' and 'Emergency Budgets of Local Government.' These budgets are primarily intended for issues of emergency situations. However, "training budgets and development budgets within line ministries have disaster risk reduction elements within them" (WMO 2012).

According to this structure, the Municipality of Tirana reserves a special fund in its yearly budget to handle emergency situations. The approved fund, for civil emergencies, is considered by the interviewees to be modest. However, in some cases an extra reserve fund is allocated, following a decision by the Municipality Council, which is the authority for this purpose. In the past, funds have also been obtained in emergencies from various donors and NGOs. The involvement of the Civil Emergencies Sector and Directory of Foreign Investment Promotion also demonstrate how the Municipality of Tirana's resources are engaged in DRR and preparedness. According to the interviews, resources available to the local government for managing risks are not sufficient and an increase of these funds is essential.

3.1.4. Risk Assessment and Risk Plan

In Tirana, pursuant to the Albanian National Emergency Plan and in collaboration with the municipal units, a risk study was conducted and a database was compiled that presented what were identified as problematic areas from natural hazards, human destruction or technological waste. Following this study, a Tirana Municipal Emergency Plan was prepared. Based on the Emergency Plan, the City of Tirana has developed a special work programme implementing measures in the field of prevention, planning, awareness and public information and emergency situations. The measures are as follows:

Prevention: According to Tirana's Emergency Work Plan, the first phase of the cycle of civil emergency is prevention. It deals with all the measures to avoid emergency situations that may affect life, activity, cultural heritage and community that can stem from a hazardous event. Prevention is accomplished by identifying and defining different levels of vulnerabilities and risk areas within the geographical limits of the city of Tirana. Following the identification of risks, more comprehensive studies are required for their management. Implementation of the EUROCODE in design and construction; intensifying labour inspection in construction; strengthening cooperation between local government bodies, the community and institutions in the Municipality of Tirana; and various inspections of land use are expected to increase public security. Furthermore, cooperation with the Albanian Geologic Service for conducting geological studies is recommended within this first phase.

Planning: According to this work programme, responsibilities should be divided in order to avoid overlapping due to limited state resources. It is recommended to build scenarios in which the roles of all institutions and structures that are involved in civil emergency management and that operate in the territory of the Municipality of Tirana are organized.

An early warning system project is to be implemented as part of the planning phase. The implementation of the urban planning practices and sustainable land development for new construction for "civil emergency management" are part of the planning phase. Public awareness and participation programmes are also part of this phase of Tirana's work plan.

According to this study, disaster emergency management in Tirana is identified as very weak and there is a need to activate all the available resources of the Municipality. Additionally, early warning information by monitoring, the maximum use of available resources and capacities, and optimum coordination are regarded to be at very low levels.

3.1.5. Urban Risk Reduction and Resilience Building

3.1.5.1. Urban Planning and Development

Albania has a very centralized planning system with the regional and the municipal councils of territorial adjustment having limited powers. According to the International Society of City and Regional Planners' (ISOCARP) Manual of Planning, in Albania "there is a great gap between the planning system and the development in reality," as in the example of Tirana, "the rigid top down planning without local adaptation and ineffective implementation or enforcement mechanisms" is unable to control the massive urban sprawls (ISOCARP 2008, 131). Furthermore, there is a "[c]ontradiction between planning and local government legislation," as well as a "serious lack of resources for planning and infrastructure provision to accommodate planned urban growth" (ibid.). As it was explored in section 3.1.2 of this report, "[t]he rate of migration from rural to urban area to urban sprawl in Albania now represents a major problem for civil protection, since the suburbs are often located in high-risk areas which can be vulnerable to hazards or industrial accidents" (WB et al. 2008, 47).

3.1.5.2. Building Codes

In June 2012, the Guidelines for Adoption of European Union (EU) Building codes and EUROCODE 8[2], providing guidance on the introduction of seismically resilient construction standards, were developed and published in Albania. Furthermore, trainings on the EUROCODE were held in all prefectures of Albania, including to representatives of local governments. Due to the relatively high seismic exposure of Albania, it is required to replace the 1989 Technical Conditions Code on Design, according to EUROCODE 8. However, there are considerable difficulties in complying with the existing codes, related to the fast and uncontrolled building boom in Albania over the last decade.

3.1.5.3. Infrastructure Investment and Improvement

According to the study conducted in collaboration with the respective directories of the Municipality and its enterprises concerning risk areas, investments were prioritized pursuant to the areas with the most need for intervention having a positive impact in minimizing the instances of emergency situations in the city. There are plans to further increase cooperation among the Directory of Planning Services, the Directory of Strategic Planning and Municipality's enterprises for interventions in the problematic areas.

Furthermore, as was reported in the example of the flooding of the Artificial Lake of Tirana, the recent reclassification of many dams in Albania according to the existing codes has not yet been followed with the necessary structural improvements and measures due to financial constraints, and the situation is compounded with difficulties in sustaining maintenance and repairs.

3.1.5.4. Insurance

In 2010, Albania became the first member country of the Swiss-based specialty property catastrophe reinsurance company Europa Reinsurance Facility Ltd. (Europa Re), which was established as part of the SEE Catastrophe Risk Insurance Facility (CRIF) project. Europa Re was created to increase the level of catastrophe insurance penetration among households and small and medium enterprises in South Eastern Europe[3].

As part of the UNISDR-WMO joint project Building Resilience to Disasters in Western Balkans and Turkey, Europa Re has in 2014 conducted training workshops in Tirana. It is also introducing an interactive website, CATMonitor, where site-users will be able to learn about the exposure of their properties and businesses to catastrophe risk and the risk mitigation measures that may need to be undertaken. The site will soon be available in Albania.

3.1.5.5. Safe Schools and Health-Care Facilities

Based on a recent pilot project, most of the schools in the city of Tirana have been reconstructed and rehabilitated with projects approved by the Municipality of Tirana in accordance with European Community standards. There are plans to continue investments to increase security in schools that are not yet reconstructed.

3.1.5.6. Post-Disaster Recovery Planning

According to the emergency plan of the Municipality of Tirana, a variety of public buildings – such as socio-cultural, sports and school facilities – have been designated as emergency shelter areas. It is planned to update this information on an as-needed basis.

3.1.5.7. Ecosystems and Climate Change

In order to protect the ecosystem of important areas in Tirana, such as the Artificial Lake Park area, peripheral parks and historical areas, legal acts and specific regulations have been developed and adopted. There are future plans to increase inspections and controls for compliance with the law. It is also planned to create specific protections for existing ecosystems and natural buffers.

3.1.5.8. Early Warning Systems

Warning and notifying systems have been organized at the local level (monitoring/notifying structures) – installed mainly in Tirana – as well as by all structures of the Municipality, municipal units, enterprises and even up to the community level for expected risks, which have been tested for emergencies. There are plans to continue improvement of cooperation programmes with monitoring/alerting institutions at the local level; the implementation of the municipal terms of the integrated system 112; and continuous updating of the notification system at the Municipality, municipal units and administrator (village headsman) levels, and up to the level of the entire community.

3.1.5.9. Public Awareness and Education

In Tirana, short- and long-term programmes on EU legislations and hazard preparedness have been designed and implemented to train Municipal staff in charge with DRR and DRM activities. There are further plans to continue work to broaden the knowledge of the structures dealing with EU issues. The goal is to expand training and education to the

[2] EUROCODE 8 is the European Union Construction Standard on the Seismic Design of Buildings (EUROCODES) Available at: http://eurocodes.jrc.ec.europa.eu/
[3] More information on Europa Re is available at http://www.europa-re.com.

community level and include video clips on the municipal website to provide education regarding specific hazards. The video clips are expected to provide training and information on hazards.

3.1.6. Challenges, Good Practices and Recommendations

Tirana is prone to a range of hazards, and the greatest single disaster threat is considered to be that of a severe earthquake. However, small-scale hazards such as floods and windstorms more frequently affect this city, which has rapidly urbanized within the last 15 years.

Albania is modernizing and decentralizing its institutional structure for disaster risk management. However, the capacity of local authorities, as depicted in the example of Tirana, is insufficient. In overall terms, the financial means for DRR in Albania are reported to be extremely limited at the present time, particularly at the local level (WMO 2012).

The centralized planning system and territorial-based planning have not been effective in controlling the building boom of the past 15 years, resulting not only in informal settlements but also in the inadequate enforcement and application of building codes in planned developments, increasing the risk to the population of both intensive disasters (such as earthquakes) and extensive disasters (such as floods). Planning systems need to be modernized and take into action real-time urban development to have any impact on risk reduction, resilience building and sustainable development.

Indeed, according to the 2011-2013 Hyogo Framework for Action (HFA) National Report of Albania, "the dynamic economic development and migration patterns experienced in Albania over the last decade, accompanied by an at times almost uncontrolled boom in construction" has introduced the "extreme challenges which this continues to bring to matters such as urban planning, and its relationship with disaster risk reduction plans and strategies has yet to be overcome" (Republic of Albania 2013). The gradual integration of disaster risk reduction into the development sectors, as outlined in the draft National Civil Emergency Plan, is considered to be an absolute priority for sustainable development in Albania (ibid.).

The City of Tirana has a risk assessment and a risk plan. However, it was not made clear from the interviews whether this risk assessment includes elements of socio-economic vulnerability assessment. The risk plan includes many structural and non-structural measures. However, how these plans will be implemented is not clear and there is a need for a strategic action plan.

Nevertheless, this plan and the urban risk reduction projects have many good elements. They include an acknowledgement of the need to update the early warning and notification system practices, for better coordination and organization in risk management, for increased public awareness and participation, for retrofitting of schools, as well as the significance of better planning and implementation of building codes for the success of risk reduction and resilience building in the City of Tirana.

3.2. SARAJEVO CENTAR, BOSNIA AND HERZEGOVINA

3.2.1. The City Profile

Fig 3.3. Sarajevo Centar *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Sarajevo is the capital city and the largest city of Bosnia and Herzegovina. It is also the capital of the Federation of Bosnia and Herzegovina (FBiH) entity, Republika Srpska (RS) entity, as well as the Sarajevo Canton. As of 2013, Sarajevo had 291,422 inhabitants and contributed 37 per cent of the total national GDP. The City of Sarajevo has four municipalities, one of which is Centar.

3.2.2. Hazard and Risk Profile

The most common hazards affecting Sarajevo Centar are earthquakes, heavy snow, avalanches, landslides and fire. Sarajevo Centar is further prone to floods, windstorms and ice storms. The most serious disaster that has affected the city within the last 20 years has been the extensive snowfall in February 2012. After three days of continuous fall, snow reached a height of 107 centimeters and affected Sarajevo Centar and its surroundings.

Earthquakes

According to territorial seismic maps, Sarajevo Centar is located in the VI degree zone of the Mercalli-Cancani-Sieberg (MCS) scale and prone to earthquakes that can cause material damage to buildings, mostly without casualties.

Earthquakes of less than III degree MCS occur daily in the Canton of Sarajevo. Annually, there are two to three stronger earthquakes that cause minor damage to buildings. The strongest earthquake that affected Sarajevo Centar took place in 1962, and had a magnitude of 6.0 degrees on the Richter scale.

Heavy Snow

Sarajevo Centar experiences intense snow precipitation from

the beginning of November to the end of March. The most intense snowfall occurs in December and January. Due to heavy snowfall, roads are sometimes fully blocked causing shortness of essential supplies and disrupting daily lives.

Avalanches and Landslides

All slopes of the City are prone to landslides and mudslides. The City has not been able to reduce risk from landslides in Sarajevo Centar due to heavy rainfall and rapid snowmelt as well as uncontrolled human activity such as illegal tree cutting, illegal construction, secondary road use by heavy vehicles and inadequate drainage and surface water drainage.

Fires

Sarajevo Centar is prone to fires due to its terrain, high population density and development, location and construction material of buildings, and the inadequate number of fire barriers. Due to the narrow and steep streets, neighbourhoods located in higher slopes are highly vulnerable to fires.

3.2.3. Institutional Capacity for DRR and DRM

In Bosnia and Herzegovina, the Federation of BiH consists of 10 cantons and 79 municipalities and RS has 62 municipalities (ISOCARP 2008, 134). Sarajevo is the capital of BiH, the FBiH, the Sarajevo Canton, as well as the RS.

Bosnia and Herzegovina has developed its National Platform for Disaster Risk Reduction. At the national level, the DRR framework is organized by the 2008 Law on the Protection and Rescue (Official Gazette BiH no.50/08). The Civil Protection Structure in the Federation of BiH reflects the structure of the administrative system, which is very complex and decentralized due to its three-tier system of federations, cantons and municipalities or cities (WMO 2012, 39).

The Sector of Protection and Rescue has formed a Civil Protection Department in Sarajevo Centar, which has staff in 15 local communities. The Civil Protection Department works closely with the Cantonal and Federal Directorate of Civil Protection, and undertakes a number of risk reduction measures. Preventive measures of protection and rescue are implemented as part of the Civil Protection Department's regular activities. Additionally, emergency and rescue services are established in civil society associations.

According to the interviews, the local authority in Sarajevo Centar has adequate knowledge and technical capacity to address hazards; however, the problem lies with specific legal regulations that do not allow the full capacity development of the local authorities. The Civil Protection Department recommends that processes and procedures regarding emergency actions should be prioritized in order to simplify the mandate of the Department, which can undertake risk reduction activities when there are no emergencies. The Civil Protection Department also recommends simplifying the Law on Public Procurement, which could be eligible for exemptions for emergency situations. According to the interviews, other legal procedures should also become more flexible in order to react faster at times of emergency.

At the international level, Sarajevo Centar has joined UNISDR's Making Cities Resilient campaign, in 2013, becoming the first city in BiH to join the Campaign. The City of Sarajevo is a twin city with Barcelona, Zagreb, Ljubljana, Dubrovnik, Lillehammer, Skopje and Konya in Europe.

3.2.3.1. Budget

The Municipality of Sarajevo Centar has a regular budget allocation for DRR and DRM, which is adequate according to interviewees.

With its budget and special benefits, the Civil Protection Department funds its staff, equipment and facilities, as well as projects such as: rehabilitation of slips, repair of Košovo stream, emergency actions such as the February 2012 snowfall and the town hall fire, and procurement of fire extinguishers and communication equipment. In addition, the Civil Protection Department has organized three emergency drills and demined the municipal territory.

With its 2014 funds, the Civil Protection Department plans to rehabilitate glides, establish an emergency alert system, continue the rehabilitation of the Ševskog stream riverbed, and purchase equipment for the new hydrant network.
The Municipality of Sarajevo Centar annually allocates a portion of its funds to help other municipalities and cities with DRR and DRM activities.

3.2.4. Risk Assessment and Risk Plan

According to the Law on Protection and Rescue, in BiH risk assessments at the local level are to be coordinated by local authorities.

According to the interviews, in the Municipality of Sarajevo Centar risk assessment studies were prepared according to regulations. However, the interviewees suggested that they should be expanded to include all potential hazards.

3.2.5. Urban Risk Reduction and Resilience Building

3.2.5.1. Urban Planning and Development

There is no Ministry of Spatial Planning at state level in BiH, although one exists at entity level (ISOCARP 2008, 134). In the FBiH, according to the Law on Spatial Planning and Land Usage, spatial plans must contain data on areas prone to flooding (ibid.).

According to an assessment of the state of urban planning in BiH, "[m]unicipalities often related to ethnic concentrations devise land-use plans on ethnic lines" and "[u]rban development plans are devised in isolation where intense construction activity is expected" (ibid.). Indeed, according to a study by Pilav (2012, 25), "Sarajevo did not and still do not really have pre-disaster risk reduction strategies in city planning, or tools that could help the people to approach and resist disaster events". This assessment is confirmed with the interviews at the Municipality of Sarajevo Centar, according to which the legislation in the field of building and land are based solely on

ownership relations, rather than reflecting information about hazards and risks.

3.2.6. Challenges, Good Practices and Recommendations

The hazard-prone geography, the consequences of a long civil conflict that has debilitated resources, and the very complex administration system, which is decentralized but not coordinated, are the main problems for effective disaster risk reduction and disaster risk management in BiH and in Sarajevo Centar.

According to the director of the Civil Protection Department in the Municipality of Sarajevo Centar, poor economic conditions of the entire society – including in the City of Sarajevo – as well as the lack of connection of competence across levels of government are the main challenges for disaster risk reduction and disaster risk management. A success story for DRR is the demining of the territory of Sarajevo Centar and landslide rehabilitation projects.

According to the interviews, it is necessary to adapt existing regulations in this field in order to simplify procedures for procurement, and the deployment of the armed forces and other entities that can contribute to disaster risk reduction.

However, the problems affecting the Municipality of Sarajevo Centar and the other local authorities in the BiH seem to be much more complex. In a study that assessed the risk management capacities in BiH, local governments were found to lack the capacity and resources to fulfill even the most basic DRR functions (UNDP and EU 2013, 30). Due to the decentralized and uncoordinated three-tier administration system, local authorities are left with inadequate mandate. In addition to the almost non-existent technical and financial capacity, local authorities are left powerless to reduce the impacts of natural hazards and climate change and to build resilience in urban areas.

As was observed during the 2014 March floods, which affected 25 per cent of the population of BiH, "[t]he condition of flood control facilities is very poor as a result of war damage, many years without maintenance, and minefields laid around some facilities" (WB et al. 2012, 36). This situation is particularly true for towns along the Sava River, such as Sarajevo.

As was previously assessed, "there is a clear need for both vertical and horizontal coordination within DRR" (UNDP and EU 2013) within the complex administration system in BiH. However, as a first step of intervention and to reduce the bureaucracies that may slow DRR and DRM activities within local authorities, it is recommended to develop the capacities at the local level as the first line of response to and mitigation of disasters (ibid). Furthermore, the local authorities should have more authority in spatial planning as well as an enforcement system in the implementation of land-use planning and building codes. There should be better horizontal coordination between local authorities and the planning system should incorporate public participation, which will ensure effective implementation. The institutional capacity building should be strengthened with technical and financial capacity building, which may depend on international aid as well as public-private cooperation for an effective DRR and DRM in Sarajevo Centar.

3.3. DUBROVNIK, CROATIA

3.3.1. The City Profile

Fig. 3.4. City of Dubrovnik *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Dubrovnik is a city in the southernmost part of Croatia and is located by the Adriatic Sea. The City of Dubrovnik has a population of 42,615 according to a 2011 census, and it belongs to the United Nations Educational, Scientific and Cultural Organization's (UNESCO's) list of World Heritage Sites due to its historic walled city.

3.3.2. Hazard and Risk Profile

The main natural hazards for the City of Dubrovnik and the surrounding towns and municipalities are open-air fires and earthquakes.

Earthquakes

The City of Dubrovnik and its surroundings are located in a very active seismological area. A tectonic rift near Dubrovnik could potentially cause an earthquake of up to magnitude 7.5 degrees on the Richter scale. The last disastrous earthquake (particularly disastrous for the historical part of the City) occurred in 1979. The 7.0 point magnitude earthquake had its epicentre in the neighbouring country of Montenegro. It affected about 1,000 buildings.

Open-air Fires

Over the past 25 years, the most severe hazard to affect Dubrovnik was the open-air fire in August 2007. The larger area of the City of Dubrovnik was caught in a disastrous fire which had started in Bosnia and Herzegovina and spread over the border regions to the territory of the City. The fire spread over an area where Dubrovnik's most important infrastructural facilities are located and destroyed more than 3,400 hectares of vegetation. The monetary damage to fire-fighting equipment reached over 140,000 euros, making it one of the worst fires in the South Eastern Europe region (Republic of Croatia 2011).

Climate Change

According to the interviews, climate change has not had a big impact on Dubrovnik. However, over the last 10 years Dubrovnik was exposed to more rainfall than usual, receiving double the amount of rain it was receiving previously. Three years ago, the City was exposed to heavy rainfall that resulted in floods.

3.3.3. Institutional Capacity for DRR and DRM

Croatia is a republic composed of 21 counties, the City of Zagreb (capital) and many districts (ISOCARP 2008). The key legal document regulating disaster management in Croatia is the Protection and Rescue Law (adopted in 2004, and amended in 2007 and 2009). Croatia established a National Platform for Disaster Risk Reduction in 2009.

The Government of the Republic of Croatia is responsible for the management and efficient functioning of the protection and rescue system in disasters (WMO 2012, 73-74). Municipalities and towns have responsibilities for fire-fighting and civil protection under the National Protection and Rescue Directorate (WB et al. 2008, 85). According to Croatia's HFA Report 2011-2013, local governments are taking more responsibilities in DRR with less support from national authorities. However, the local response system is based on local capacities to a greater extent (Republic of Croatia 2013, 7).

The City of Dubrovnik has founded the Headquarters of Protection and Rescue as a professional operative body offering professional help and preparing actions of protection and rescue directed by the Mayor himself. The Headquarters proposes measures for prevention and disaster risk reduction and is activated in cases of threat and catastrophe.

According to the interviews, the local government in Dubrovnik has adequate mandate for DRR and DRM. The National Law on Protection and Rescue is the guiding legislation. The Town Assembly sanctions yearly programmes for the protection and rescue system. Town Assembly sessions enable wider public discussions. The local government has the mandate and the necessary resources through its budget mechanisms.

The City of Dubrovnik is a member of the Croatian NPDRR. The City cooperates with many cities on disaster risk reduction at the international, regional and national levels. It is a twin city with Ravenna, Vukovar, Graz, Helsinborg, Ragusa, Sarajevo, Rueil Malmaison and Bad Homburg in Europe. There is long-standing cooperation (since 2002) with its sister city, the City of Bad Homburg, Germany, with which Dubrovnik recently established very good cooperation. The fire-fighting headquarters exchange experiences and specifics of the two cities. In 2012, part of the commanding staff of Dubrovnik's fire-fighters had a two-week training trip to Bad Homburg, and a brigade of young fire-fighters from Bad Homburg also spent two weeks training and familiarizing themselves with the specifics of fire protection in the Dubrovnik region. Continued mutual training and exchange of fire personnel was agreed. Furthermore, cooperation with the sister city of Sarajevo is being maintained through conference participation and introductions to the civil protection system. During the floods of March 2014 that affected Bosnia and Herzegovina and parts of Croatia, Croatia immediately organized and helped out with food, water and hygiene, as well as supplies such as clothes, shoes and medicines. The City of Dubrovnik donated 40,000 euros and the Headquarters of Civil Protection and Rescue also bought four pumps for pumping water, valued at around 2,900 euros, from its annual budget.

Furthermore, some Dubrovnik fire-fighters went to East Slavonia, the flooded area in Croatia. They discovered that mosquitoes represented a major problem in the flooded areas as potential carriers of infection. The Croatian Government provided funds for spraying the whole flooded area, including areas of Serbia and of Bosnia and Herzegovina.

3.3.3.1. Budget

In Croatia, at the county level and local government level, DRR and DRM funds are allocated in their respective budgets (WB et al. 2008, 85). However, according to the Croatian National HFA Reports, "[i]nsufficient funds have been allocated for DRR at local level" and "[l]ocal DRR activities have been supported at national level" (Republic of Croatia 2013, 6). Furthermore, the "[l]imited budget has been obstructing desired development and the necessary preparedness levels" (ibid., 7).

The City of Dubrovnik allocates significant budget resources for the protection and rescue system each year. In 2013, a total of 2,060,000 euros was spent on fire-fighting and 82,000 euros on civil protection. Half of this budget, one million euros, was provided by the State of Croatia. However, every year the amount provided to the city by the State is reduced. According to the interviews, it is likely that there will not be any budget allocated from the State of Croatia in five years' time.

Despite this situation, according to the interviews, the City of Dubrovnik has enough resources for everyday preparedness actions, and the City increases these funds every year. For instance, there was a budget of 50,000 euros for civil protection five years ago and the City has increased it to 82,000 euros. However, these resources are not considered to be sufficient in the case of a disastrous earthquake. In such cases, the interviewees hope that significant help would be obtained from the State of Croatia and European Funds.

With last year's budget the City of Dubrovnik bought equipment for search and rescue teams such as thermal cameras, protective shoes, helmets, bags, stretchers, diving equipment and 10 communication radios.

3.3.4. Risk Assessment and Risk Plan

Following the 2009 National Risk Assessment in Croatia, counties and local governments are beginning the process of local risk assessments. As of 2012, 90 per cent of local governments are now contracted, 50 per cent have commenced and 15 per cent have completed their risk assessments (UNDP and EU 2012, 33).
The City of Dubrovnik is one of the local governments that has completed its risk assessment. The City used the services of a specialized firm for its risk assessment, which was prepared last year and will be in effect for the next five years. Even

though it is a city-wide multi-hazard risk assessment, the main stress of the study is earthquakes. The risk assessment is currently being implemented and renewed due to changes in law and methodology during the year. Completion of a new risk assessment is expected by year-end. The City of Dubrovnik also keeps track of historical records of disasters and disaster losses, which are publicly available.

3.3.4.1. Risk Plan

According to the Protection and Rescue Law, local self-governments are responsible for the development of draft protection and rescue plans (disaster preparedness plans) for their respective administrative units (WMO 2012, 71).

The City of Dubrovnik makes all subsequent plans on the basis of its risk assessment, including the Plan for the Protection of Life and the Plan for the Evacuation of People. The old city has only three exits, which creates an evacuation problem – especially in the summer months, when the population increases to 15-20,000 people. Consequently, Dubrovnik entered into a contract with a firm to prepare an evacuation plan for the old city, which is prone to the risk of fire as many buildings although built of stone (following the earthquake of 1667 which caused a large fire that destroyed the old city) have wooden floors. Fire brigades also have to use a special powder according to strict UNESCO regulations.

Another contract was made concerning the maintenance of the protection and rescue system. The City has a contract with construction firms, which have agreed to provide technical equipment in case of large-scale disasters. The City also has a contract with big stores to supply food and with hotels to supply shelter in case of disasters, and renews these contracts every two years.

3.3.5. Urban Risk Reduction and Resilience Building

3.3.5.1. Urban Planning and Urban Development

In Croatia, the state is responsible for the operation of the planning system, and the formulation and enforcement of the planning regulations and instruments (ISOCARP 2008, 135). The main regulation in urban planning is the Law on Physical Planning (Zoning), (N. 30/94, 68/98, 35/99, 32/02). The Ministry of Environmental Protection and Physical Planning ensures that the plans and policies have been formally approved and adopted by the appropriate local authorities. The county and district authorities are empowered to prepare, as appropriate, regional and local plans. According to the Croatian National Report, spatial plans are being developed according to the DRR approach, considering risks to populations and the environment (Republic of Croatia 2013, 3).
The municipal authorities are responsible for the exercise of planning control over the development and use of land (ISOCARP 2008, 135). However, there are only five towns in Croatia with strict urban plans, one of which is Dubrovnik.

In Dubrovnik, the Department of Urban Planning and the Protection of Environment are working in collaboration with the Department of Protection and Rescue to improve urban plans. Every urban planning and development plan contains a risk assessment which has to be integrated in the plan in the first phase of the planning process. Accordingly, all urban plans are prepared using risk assessment as a basis. According to the Urban Planning Department of the City of Dubrovnik, in general the existence of informal settlements is due to very strict building regulations and the long time it takes to obtain permits. However, despite high levels of informal settlements in Croatia, and especially in the Adriatic Coast, there are no informal settlements within the borders of Dubrovnik.

3.3.5.2. Building Codes

Building regulations in Dubrovnik began to be rigidly controlled after the disastrous earthquake in Skopje in 1963. However, "[t]here is pressure exerted on the part of the construction investors to reduce building codes as they increase construction costs (Republic of Croatia 2013, 21). All recent buildings in Croatia are built to withstand intense earthquakes. However, in the old city of Dubrovnik there are many buildings dating over a hundred years which would not meet these standards. According to the interviews, enforcing the codes on such buildings would be a great challenge both financially and in terms of restoration. Such action may require financial assistance from European funds. In other projects, all newly planned buildings must have a fire protection plan.

3.3.5.3. Infrastructure Investment and Improvement

In the City of Dubrovnik, earthquake shock absorption capabilities are added to improve existing infrastructure. Furthermore, structural measures are taken to upgrade critical infrastructure to withstand the effects of hazards and the long-term effects of climate change. A new electrical substation will ensure an alternative energy supply, which had previously been acquired from a single station. In addition, with its own funds, loan funds and the funds of Croatian Water (the legal entity for water management), the water-supply infrastructure is being extended to rural areas that until now have not had an adequate water supply from the city water supply company.

3.3.5.4. Insurance

The City of Dubrovnik has a number of financial tools for individuals and businesses to protect themselves from disaster risk. They include Domestic Non-Compulsory Insurance, Non-Domestic Compulsory Insurance as well as Non-Domestic Non-Compulsory Insurance. Drought insurance does not exist in Dubrovnik and in the State of Croatia (Republic of Croatia 2013, 19).

3.3.5.5. Post-Disaster Recovery Planning

The City of Dubrovnik does not have any existing strategies for post-disaster reconstruction and recovery in its risk plans or in urban plans. However, by the sanction of the Headquarters, the Department of Protection and Rescue initiated the process of ceding shelters, which are under the City's possession, for the use of various civil associations and organizations and their involvement in the system of civil protection and rescue. These shelters were used during the siege of the City in the

1991-1995 war. Since the war, 22 shelters have been painted and cleaned completely. The Department of Protection and Rescue made these shelters available to civil unions for activities such as dancing and sports. In return, during times of hazards the leader of the civil union in charge of a shelter is expected to be actively involved in recovery.

3.3.5.6. Ecosystem Services and Climate Change

The State of Croatia has a mechanism to protect and restore regulatory ecosystem services. In accordance with spatial plans, for every building under construction there has to be an environmental impact study drafted, and EU directive SEVESO II[4] is implemented into national legislation (Republic of Croatia 2013, 18). However, the acceptance of climate change impacts as risk factors is rather slow. The City of Dubrovnik also supports the restoration, protection and sustainable management of ecosystem services such as forests, coastal zones, coastal wetlands, mangroves or reefs, water resources, river basins and agricultural farmland.

3.3.5.7. Emergency Preparedness

The City of Dubrovnik has an emergency management plan, emergency responders, equipment and relief supply needs, and food, shelter, staple goods and fuel supply for emergency situations. However, the City still needs to continue obtaining equipment for the members of the protection and rescue system and to carry on the training of civil protection units for protection and rescue. The City plans to conduct emergency exercises in primary schools and for the members of its civil protection team.

The Department of Protection and Rescue works continuously on the education of staff every year. Twenty to 30 people, not only from headquarters but also from fire-brigades, first aiders and police, are involved in training.

The City also conducts regular emergency drills in critical facilities annually. For instance, in 2014 the City conducted a fire drill exercise in its largest elementary school, which has 700 pupils and 100 staff. During the drill, one student was caught in the bathroom and the rescue dog found him, deeming the drill successful. The City plans to have two exercises per year in an elementary and secondary education institution.

3.3.5.8. Public Awareness and Education

Hazards and risks form part of school curricula in Croatia, although not to a sufficiently significant extent. The City of Dubrovnik raises awareness by distributing flyers and digital media to school children in elementary and high schools. Furthermore, the City uses public awareness campaigns to share hazard and risk information to the community with its official city website and the public exercises which were discussed in Section 3.3.5.7 of this report. Additional training and education is being implemented for urban professionals (such as urban planners, architects, construction labour, building inspectors).

3.3.6. Challenges, Good Practices and Recommendations

Croatia has made many developments in institutional and capacity building for DRR in the last decade. The National Protection and Rescue Directorate has prepared the country's first national risk assessment, followed by risk assessments by local authorities – one of which is Dubrovnik. While it seems that there is a good vertical coordination in the nations' DRR system and local governments have necessary mandates for DRR activities, they usually do not have the necessary financial and technical resources.

While strengthening of the system at the local level is a precondition of successful DRR and resilience building, the State of Croatia is planning to restructure its political administration system and to reduce the number of local self-government bodies, which is part of its future strategy for DRR (Republic of Croatia 2013, 6).

The City of Dubrovnik has initiated many successful projects for reducing its risks from natural hazards and especially from earthquakes. However, the City still faces some challenges, such as problems in implementation due to built-up urban space and historical assets and limited public awareness and participation. Indeed, local government is the only functioning organization that actively participates in decision making, policy making, planning and implementation processes for disaster risk reduction in the City of Dubrovnik. Furthermore, the City faces challenges due to the limited budget in case it is affected by a major disaster.

Despite these challenges, the City of Dubrovnik has experienced clear success stories. For instance, even though there are widespread problems of land-use control and implementation in Croatia, the City of Dubrovnik has managed to control land development and building practices. There are no illegal developments. Furthermore, the City's Departments of Protection and Rescue and Urban Planning are in close collaboration and actively integrating risk assessments into land-use plans.

One exemplary innovative case in DRR practices in the City of Dubrovnik is the use of City shelters by various civil associations and organizations and their involvement in the system of civil protection and rescue. The City also has exemplary collaboration with private corporations, especially as part of post-disaster recovery plans for sheltering.

To achieve further success in DRR, and most importantly resilience building in Dubrovnik, interviewees recommended including as far as possible legal subjects, associations and NGOs into disaster risk reduction. The City must also further consider planning for potential hazards other than earthquakes. South Eastern Europe and especially the Mediterranean is very prone to the impacts of climate change. Being situated along the Adriatic coast and having tourism as its primary economic sector, the City of Dubrovnik needs to consider that climate change could impact the city and its economy immensely. For its future DRR and resilience-building activities, the City of Dubrovnik would benefit immensely

[4] Council Directive 82/501/EEC on the major-accident hazards of certain industrial activities (OJ No L 230 of 5 August 1982) – the so-called Seveso directive – was adopted in 1982. On 9 December 1996, Council Directive 96/82/EC on the control of major-accident hazards – the so-called Seveso II Directive - was adopted and replaced the original Seveso Directive. (The European Commission) Available at: http://ec.europa.eu/environment/seveso/

from raising awareness and increasing its knowledge-based capacity on the potential impacts of climate change that may affect the city.

3.4. PRISTINA, KOSOVO*

3.4.1. The City Profile

Fig.3.5. City of Pristina *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Pristina is the capital and the largest city of Kosovo*, located in the north-eastern part of the country. It is estimated to have a population of 430,000 and has a high population density, which reaches 690 to 700 people per km (Pristina Municipality 2009, 9). The territory of the Municipality of Pristina is 572 km2, of which the city area accounts for 43.35 km2. It is divided into 47 cadastral areas (ibid.).

3.4.2. Hazard and Risk Profile

According to the Risk Assessment Document of the Municipality of Pristina, the most severe disasters that have affected Pristina are floods and heavy snow. They have caused more damage to the city than other hazard.

Floods

According to Pristina's Risk Assessment, the territory of the Municipality of Pristina has poor underground water resources. Its rivers depend mainly on rainfall and snow melting during the months of October to May. There is a potential risk of flooding from the river Lab in case of heavy rainfall that could threaten surrounding villages (City of Pristina 2009, 38). On the other hand, the City is mostly threatened by a potential eruption of the deteriorated dams (ibid., 13).

Earthquakes

The City of Pristina is located in a seismologically active area and it was affected by damaging earthquakes, the last of which occurred in 1979. According to the risk assessment, the risk of earthquakes in the territory of Pristina is classified as high and very high.

Landslides

In most cases, landslides in Pristina are the direct result of earthquakes, flooding or major precipitation events. The neighbourhoods of Arberia and Velania are highly prone to landslides due to the composition of soil and they may be prone to considerable damage (ibid., 40).

Heavy Rain

In the Pristina region, precipitation occurs in smaller quantities with average falls only 582 mm per square meter per year. However, at times of heavy rain and snow considerable damage can occur, especially in the city districts of Field Reconciliation Quarter Hospital, the neighbourhood of Kolovicës and the village of Shkabaj, due to illegal construction in these areas.

Heavy Snow

Heavy snow in Pristina occurs from the months of December to March, affecting mostly the villages towards the border with Serbia and those that lie on the border with the Municipality of Novo Brdo. The possibility of damage from heavy snow is considered to be minor to the population and material goods. Transportation routes are vulnerable during the winter season, especially in the hilly roads of the mountain villages. Avalanches of snow and frost potentially may cause disruptions to traffic and the supply of vital products and medical aid in rural parts of the Municipality (ibid., 41).

3.4.3. Institutional Capacity for DRR and DRM

Kosovo* is composed by 30 municipalities (ISOCARP 2008, 137) and is in the process of setting up an emergency management system (UNDP and EC 2012, 38) and a coordination mechanism for Disaster Risk Reduction.

In the municipality of Pristina, the Sector for Protection and Rescue is the entity in charge of disaster risk reduction, risk assessment and disaster risk management, including public information. The Sector is composed of 17 staff and fire-fighters.

The local government has its own legislation covering disasters caused by natural hazards and it also has administrative instructions. There are several laws and plans, including: Risk Assessment at Municipality, Emergency Response at Municipality, Fire Protection Plan, and Evacuation Plans for Specific Buildings such as government and municipal buildings. These plans are approved by the Municipality of Pristina. According to the interviews, the City has satisfactory authority for DRR and DRM activities.

In the international arena, the Municipality of Pristina has been a member of the Making Cities Resilient campaign since May 2010. It is a twin city with Ankara, Bursa, Durres and Tirana in Europe. The Municipality also has very good cooperation with the region's municipalities in order to harmonize risk assessment, protection and rescue. The Municipality of Pristina conducts frequent meetings with other municipalities, as well as with the Emergency Management Agency, Kosovo Police, the

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence.

Hydro-Net Institution and the Institute of Seismology. The Municipality is also in continuous partnership with the Regional System for Water Supply.

According to the interviews, the Municipality of Pristina has adequate capacity for legislation and to undertake related paperwork. However, the financial and technical capacities, such as those involving fire-fighters or search and rescue equipment, could be improved. When major disasters occur, the Municipality engages with the private sector to join their operations.

3.4.3.1. Budget

In general, there is no budget allocated for DRR or DRM at the municipal level. When a disaster occurs, a municipal committee makes a cost estimate of the loss and the municipality allocates a budget to reimburse the damages caused by the disaster. If this budget is not adequate, the municipality requests a further allocation from the central government. For instance, in 2013 when a flood affected the City of Pristina, the central government supported the Municipality with an additional 200,000 euros.

The Municipality can collect a budget for damages, but not for risk assessment. According to the interviews, the Municipality does not have financial capacity at the level that is needed.

3.4.4. Risk Assessment and Risk Plan

The Municipality of Pristina has a Multi-hazard Risk Assessment, which was prepared by a consultative group of experts in 2009 and accords hazard classification to earthquakes, floods and other hazards. The Institutes of Seismology, Meteorology, Public Health and Statistics have helped the Municipality of Pristina on a voluntary basis.

3.4.4.1. Risk Plan

Apart from the Risk Assessment, the Municipality of Pristina has a number of plans prepared by the Sector for Protection and Rescue. They include the Plan on Emergency Response at Municipality, the Fire Protection Plan and Evacuation Plans for Specific Buildings, such as government and municipal buildings.

The Municipality of Pristina undertakes DRR actions based on proposals developed in the City's Risk Assessment Plan. For instance, public housing, public utilities and other multiple-floor facilities are estimated to have high risk during earthquakes. According to the City's Risk Assessment Plan, it is necessary to plan for the evacuation and sheltering of the population at risk, and for the provisions of the necessary food, clothing and medication in necessary quantities to relevant institutions operating in the municipality (City of Pristina 2009, 39).

According to Pristina's Risk Assessment Plan, in order to reduce damages from potential earthquakes it is recommended to: 1) use codes and construction standards to withstand seismic events; 2) have urban spatial planning and protective measures which will take into account the type of construction and materials used and the influx of residents in some neighbourhoods; 3) have preventive and preparatory measures to reduce the potential damage to supporting infrastructure; and 4) increase public awareness and conduct emergency drills (ibid.).

In order to minimize the damage from floods, Pristina's Risk Assessment Plan recommends to: 1) demolish buildings without plans (especially those located close to the river basin); 2) regulate river beds and Vellusha Pristina; and 3) rehabilitate the functioning of the sewage and wastewater system (ibid.).

The Municipality of Pristina also built two water collection pipes to 'hold' rainfall and reduce the risk of flooding. They were able to prevent most of the city from flooding in the last rainfall event.

In order to protect against the risk of landslides, investments were made to stabilize the terrain in Velania neighbourhood. According to the Risk Assessment Plan, the Municipality further plans to take the following measures: 1) demolish buildings in unplanned neighbourhoods and to stabilize the terrain; and 2) implement urban plans and evacuation plans for citizens (ibid., 41).

According to the interviews, informal settlements in the Municipality of Pristina make DRR more difficult. In addition to floods, landslides and earthquakes, informal settlements are prone to fire emergencies. Furthermore, many of the informal construction in the Municipality of Pristina is located in the middle of streets, which prevents fire trucks from reaching their destinations.

3.4.5. Urban Risk Reduction and Resilience Building

3.4.5.1. Urban Planning and Development

The main planning legislation in Kosovo* is the Spatial Planning Law of 2003. Since 2002, the Ministry of Environment and Spatial Planning has been in charge of determining the land-use and building codes for the entire country (ISOCARP 2008, 137).

Municipalities prepare a multi-sectoral municipal spatial, economic and social development plan, an urban development plan and urban regulatory plans (ISOCARP 2008, 137). Municipal construction inspectors ensure compliance of development with the plans and enforce locally set penalties (ibid.).

The United Nations Human Settlements Programme (UN-Habitat) Disaster Risk Assessment and Mapping Programme in Kosovo undertook two case studies to incorporate disaster risk into urban planning in the cities of Gjilan and Ferizaj. However, the Municipality Urban Development Plans (MUDPs) are not enforced by the Ministry for all cities. This should be considered as a requirement, according to the interviewees. The Urban Planning Program in the Municipality of Pristina does not have a section on disasters caused by natural hazards. However, there are protection actions based on the Risk Assessment Plan implemented for hazard zones.

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3.4.6. Challenges, Good Practices and Recommendations

Kosovo* still needs to strengthen its institutional system in relation to DRR and DRM. More importantly, the financial, technical and knowledge-based capacity need to be improved both at the national but more so at the local levels. As the interviews have suggested, there is inadequate financial, technical and knowledge-based capacity for the Sector for Protection and Rescue in the City of Pristina.

According to the interviews, the main challenge for successful DRR and DRM practices in Pristina is the lack of inclusion of natural hazards in the urban development plans. There were successful projects in two other cities through the MUDPs of UN-Habitat. It is recommended to expand this programme nationwide to all urban areas.

Non-implementation of building codes, standards and quality assurance of concrete and steel are the other biggest challenges in the City of Pristina. Generally, the EUROCODE building codes are being used. However, this is not enforced by law. The use of building codes depends solely on the construction companies and the engineers in charge. Poorly constructed infrastructure, such as roads and highways, is another challenge that Pristina faces. In the past this has led to bridges failing due to erosion.

The City has successfully prepared a Risk Assessment Plan with the help of technical consultants and other national agencies. It is recommended to update this risk assessment to include socio-economic vulnerability and take into account multiple hazards such as the impacts of climate change. Since 2004, 80 per cent of Kosovo's* municipalities are estimated to have suffered from water shortages due to hydrological drought and the misuse of water resources (UNISDR 2008). Considering that the frequency and severity of floods, droughts and extreme weather is expected to increase in the SEE region, more attention needs to be given to extreme weather and water resources in Pristina, which may be particularly impacted by droughts due to the deficiencies of its out-dated water infrastructure.

The Municipality has provided action points to reduce disaster risks based on its risk assessment. However, most of these action points focus on structural interventions. The Municipality of Pristina needs to consider more public involvement and awareness in DRR and DRM.

Despite these limitations, the Municipality has a success story with the recently built water collectors to reduce the risk of floods. In addition, the Municipality has worked to regulate river beds against the widespread post-war building boom and urbanization. The Municipality has also organized school drills and a functioning alarm system (sirens) in the city for emergencies, which was damaged during the war. The Head of the Sector for Protection and Rescue in the City of Pristina envisions "sensibilization of all departments and capacity in the disaster management chain and public information about disaster management such as doing more disaster management drills" for future projects of DRR and DRM in Pristina.

3.5. STRUMICA, THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

3.5.1. The City Profile

Fig.3.6. City of Strumica. *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Strumica is a city in the former Yugoslav Republic of Macedonia, located in its south-east region. According to the 2002 census, the City of Strumica has 54,676 inhabitants and a 485.59 km^2 land area. The City is divided into 25 settlements.

3.5.2. Hazard and Risk Profile

Strumica is prone to earthquakes, storms and short rain showers, floods, droughts, winds, fires and landslides. Within the last 20 years, the most frequent hazards that have affected the city are earthquakes and floods. The worst disaster that has affected the city is a fire.

Earthquakes

According to Seismic Maps of the National Institute of Earthquake Engineering in Skopje, Strumica is prone to an earthquake with a maximum intensity of VIII degrees on the MSC scale. According to assessments, in case of an earthquake there could be moderate to heavy damage to type C buildings (timber construction built after 1964), severe and devastating damage could occur to type B buildings (brick buildings, big block buildings with wooden ceiling structure, and cut-stone building built pre-1964), and particular buildings of type A could be completely demolished (rough stone buildings, rural buildings and houses made of unbaked brick and rammed clay).

In 1931, the City was affected by a 6.7 magnitude earthquake, which occurred in Valandova, a town 20 km away from the city. Within the last 20 years, Strumica was affected by successive Valandova earthquakes in 2009 and the population was evacuated and sheltered in the city park and in other secure areas.

Floods

Another frequent hazard in Strumica is flooding. The most recent flood occurred in the spring of 2013 and affected at that time part of the city area and particularly the agricultural land and countryside of the villages closest to the city.

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence.

In 2004, torrential rain that affected 13 villages in the Strumica region had a major impact on agriculture, causing big losses to the economy (WHO 2004, 10). As local rivers burst their banks through the intense rain, there was sewage overflow due to the poor condition of the canal systems (ibid.). According to an assessment of this flood, the two-canal system (one for sewage and one for irrigation and drainage) in the Strumica region was not maintained effectively and "there were even some deliberate blockages aimed at improving irrigation of the fields during dry periods" (ibid).

The biggest disaster risk in Strumica is expected to be flooding from the two dams Turija and Vodocha, should they burst. Such an event could potentially affect half of the city. The consequences to the population, the measures to be undertaken and the forces that would be executed are listed in a separate document adopted by Strumica's City Council. All institutions and services involved in the protection and rescue system act upon this document.

Fires

The worst disaster to affect Strumica in the last 20 years was the disastrous fire of July and August 2012 when 641 hectares of forest was completely destroyed, 18 people were seriously injured and four people lost their lives. The economic damage from this fire has been estimated at about US$1.3 million. The environmental damage was estimated at $2 million.

This was the most destructive fire that Strumica has experienced. The social impact analysis after the fire revealed the severe poverty and marginalization of the residents of the Tursko Maalo, where the fire started. The population living in Tursko Maalo is Strumica's Roma community. Living in shelters built from scrap metal and cardboard, they are the most vulnerable and socio-economically deprived community in the City. Four children from this population and 14 residents helping with fire-fighting were injured. The fire had been caused by illegal logging and stealing from villages, creating a major environmental problem for the city.

3.5.3. Institutional Capacity for DRR and DRM

The former Yugoslav Republic of Macedonia is a republic composed of 84 municipalities grouped into eight statistical regions (ISOCARP 2008, 138). The 2004 Law on Protection and Rescue and the 2005 Law on Crisis Management are the key national laws related to DRR and DRM. The Crisis Management Center is an independent state administration body in charge of DRR and DRM in the former Yugoslav Republic of Macedonia. It has regional offices and 27 Regional Crisis Management Centres, one of which is the Municipality of Strumica (WMO 2012, 112). The former Yugoslav Republic of Macedonia initiated its National Platform for Disaster Risk Reduction in 2007.

The Law on Protection and Rescue regulates the division of responsibilities to local governments in accordance with the provisions in the Law of Local Self-Government (WB et al. 2012, 95). According to the Law on Protection and Rescue, local self-governments are responsible for enforcement of the measures for initiating disaster risk reduction. The Municipality is the first body responsible for citizens in case of disasters. Furthermore, the municipalities are obligated to plan for emergencies, and provide funds, equipment and qualified human resources for realization by the authorities. The Mayor, the City Council and the rescue and protection personnel are the main bodies in case of an emergency.

The Municipality of Strumica has a Municipal Crisis Headquarters for protection and rescue. This Headquarters is composed of the Mayor, the Secretary of the Crisis Staff and other members of staff. Other bodies in Strumica include the Regional Centre for Crisis Management, the Directorate for Protection and Rescue, the UNDP in the former Yugoslav Republic of Macedonia, the Municipal Fire-fighting Unit of Strumica and the Public Heath Institution, along with other institutions and services that relate to DRR and DRM activities.

According to the interviews, the Municipality of Strumica has excellent collaboration with international, national and regional governments and cities over disaster risk reduction and resilience building. All the regional institutions, agencies and other bodies are part of this process. The city is a twin with Beijelo Polje, Rejkjavik, Elektrosalj, Grujec, Piacenza, Petrich, Koper and Grojec in Europe.

At the international level, the Municipality of Strumica has joined UNISDR's Making Cities Resilient campaign. UNDP and WHO have also given the Municipality great support for its DRR and DRM activities over many years. According to the interviews, many of the very significant projects of the Municipality have been supported institutionally and financially by UNDP.

At the national level, in case of a major emergency the national Government, including the Ministry of Internal Affairs, has the obligation to provide sustainable support for fire suppression by securing the forest in case of fire. The Ministry also regulates traffic near disaster locations and provides specialist equipment such as bulldozers, helicopters and other vehicles in addition to other support. In addition, the Ministry of Internal Affairs, along with the Municipality of Strumica, organizes public awareness campaigns for risk prevention.

At the national level, another responsible institution for DRM is the Ministry of Health, and its three regional health institutions: the General Hospital, the Health Unit and the Public Health Center. These institutions, which provide healthcare to approximately 220,000 citizens, collaborate extensively with the Municipality of Strumica. However, these institutions have a lack of medical supplies in reserve and inadequate numbers of vehicles to operate in crisis situations. They are in need of capacity building.

The Municipal Fire-fighting Unit is under the jurisdiction of the Municipality. According to the interviews, there is extensive collaboration with the fire-fighting unit at times of emergencies as well as on common projects related to capacity building of the local population on risk reduction from fires. The other two very important institutions which the Municipality of Strumica cooperates with are the Protection and Rescue Directorate, with its headquarters in Strumica, and the Center for Crisis Management. Both organizations have many projects which have been implemented and supported by the Municipality of Strumica. They also have the capacity to react in emergency situations.

The Red Cross is also in collaboration with the Municipality and

is preparing several preparedness and capacity building projects for elementary and high schools, as well as kindergartens.

Despite having good collaboration at all levels, the interviewees are concerned over the absence of a dedicated specialist unit that would be permanently responsible for investigating hazard risks. Such a unit is considered very important for further success in disaster risk reduction in Strumica. When necessary, the Municipality hires experts – such as it did for the "Vulnerability assessments of all 25 settlements in Strumica" study that included earthquakes, floods, fires and rivers in the City.

According to the interviews, the Municipality of Strumica is equipped with adequate mandate, legislation, authority as well as knowledge-based capacity to address hazards. The Municipality's technical capacity is adequate for minor hazards and day-to-day functions. However, it is not adequate in case of bigger disasters. For instance, the Municipality has just four fire-fighting vehicles, and only one of them is 'modern'. In case of a large fire, technical equipment is not deemed to be adequate. The municipality is planning to keep on developing good projects and is searching for international funding and programmes to upgrade its technical capacity to respond to disasters caused by natural hazards.

3.5.3.1. Budget

Within the budgets of municipalities in the former Yugoslav Republic of Macedonia, there are resources planned for disaster reduction, including for recovery and mitigation. On the municipal level, multi-stakeholder local NPDRR Councils are formed to assess local risks and threats, coordinate resources and activities, organize rural and urban communities, and cooperate with neighbouring municipalities (FYRoM 2013, 8).

For the City of Strumica, according to the 2012 Programme for Protection and Rescue, Fire-fighting Protection and Crisis Management, there is a regular budget allocation for disaster risk reduction and risk management in two separate sub-programmes: WO, with a fund of 8 million denars, and EO, with a fund of 2.41 million denars, annually. These budgets are allocated for the following activities: risk reduction; capacity building; technical interventions; training programmes of the administration, the fire-fighting unit and the local population for disaster prevention; performance of tactical exercises for fire-fighting and rescue of people, animals and material goods in case of disasters caused by natural hazards of any kind; examination of the 'legitimacy' of existing equipment; promotion of prevention activities (trainings, seminars, patrols through the local media); technical equipping of the Fire-fighting Unit Strumica; cooperation with companies and bodies that are a part of the agricultural economy; electrical energy; water-system; business preparedness visits and building businesses' resilience capacity; updating the mobilization plan; and other forms of support and help.

These funds are considered to be adequate for everyday risks and hazards. In case of minor disasters, the Municipality has the financial capacity for first-aid action. Furthermore, the Municipality has used its funds to prevent storm damage from spring rain affecting households in the city and in the villages, in addition to assisting them with financial help for recovery. In 2013, the Municipality of Strumica implemented and financed the 'Building of the Sewage Canal for Atmospheric Water' project, which is expected to prevent flood damage to households.

According to the interviews, the Municipality of Strumica does not have the necessary financial capacity for bigger disasters such as the 2012 fire. However, it has a good external capacity due to formalized collaborations. The Municipality of Strumica has received financial support from major international organizations such as UNDP and others, in case of major disasters caused by natural hazards.

3.5.4. Risk Assessment and Risk Plan

According to the Law on Protection and Rescue, in the former Yugoslav Republic of Macedonia the assessment of the territory of municipalities is to be passed by the respective Municipality Councils (UNDP and EC 2012, 35). The Crisis Management Center is mandated to prepare national as well as all-local-risks and hazards assessments, the methodology of which is in line with EU Guidelines on risk assessment and mapping. The local-level assessments will be conducted by the regional offices of the Crisis Management Center in cooperation with the municipal authorities (ibid.).

The Crisis Management Center aims to develop a National Disaster Database and to establish a National Disaster Observatory, which will serve as an open platform for local authorities to contribute and to use disaster data to enhance their capacities (ibid., 37).

In order to conform to the Law and regulations, the Municipality of Strumica has established and adopted the following documents in the area of risk reduction: Vulnerability assessment; Plan for protection and rescue; Annual programme for protection and rescue; and a Programme for action in winter conditions.

All these documents contain information about disaster risk estimation on the territory of Strumica, measures to reduce this risk, the necessary plan of action that includes a systematic action for protection and rescue, and the spatial units on the territory of the municipality near urban communities.

In 2008, the risk assessment of the City of Strumica was prepared and a plan was accepted by the City Council. The assessment evaluates the vulnerability of the population, material, cultural resources and the environment in disasters and major emergencies.

3.5.4.1. Risk Plan

The Municipality of Strumica has a risk management plan, which is included in the official document 'Plan for protection and rescue from natural disasters and other hazards of Municipality of Strumica'. This plan regulates the protection and rescue of the population and assets from natural hazards, epidemics and other hazards in peace and in war conditions on the territory of the Municipality of Strumica. The plan contains all the details for mobilization, evacuation, action and other sub-documents for crisis management.

The Municipality has undertaken a number of DRR and DRM projects, including:

- The pilot project 'Capacity building of the Centre for Crisis Management,' which was implemented

by the Municipal organization of the Red Cross in Strumica in three elementary and high schools. The 2009-2010 project was co-financed by UNDP and the Japanese government, and was supported by the Municipality of Strumica. This project was implemented in four other schools in Strumica, in 2010.

- The 'Capacity building of the local authorities for management of the damages from natural hazards and disasters' project, which was implemented by Red Cross Strumica, the Fire-fighting Unit Strumica, the Regional Crisis Management Center, and the Directorate for Protection and Rescue in all the elementary schools, high schools, kindergartens and the local administration in 2011. The project was supported by UNDP and the Municipality of Strumica. Participation of the project team with the city Makedonska Kamenica was financed by UNDP, in 2011.
- The 'Influence of the climate changes and the disasters caused by natural hazards/dangers and the risk form them in the Southeast region in Macedonia' project, with the support of UNDP and the NGO Planetum, in 2012.
- The 'Organization and execution of demonstrative tactical exercise of fire-fighting and management of consequences from earthquake and other natural disasters' project, in May 2012.
- The 'Be your own fire-fighter' project of the Strumica Fire-fighting Unit, which was geared towards the education and training of the local population in Strumica against fires. This project was financed by the Municipality of Strumica.
- The 'Building of coordination capacity of Municipality of Strumica in case of forest fire' project, which included a demonstrative tactical exercise, in May 2013. This project was financed by UNDP and supported by the NGO Planetum and others.

There are many more projects and activities that the Municipality has implemented to raise awareness of the population to prevent disasters, to reduce risk and to make the City of Strumica become more resilient to hazards.

3.5.5. Urban Risk Reduction and Resilience Building

3.5.5.1. Urban Planning and Development

The Ministry of Environment and Physical Planning is the main central government body responsible for environmental management and spatial planning in the former Yugoslav Republic of Macedonia (ISOCARP 2008, 138). The 2002 Law on Local Self-Government transferred power to the municipalities related to public services, environment, urban and rural planning, economic development and local finance (ibid.).

The Law for Territorial and Urban Planning prescribes the identification of flood- and landslide-prone areas as part of the General Urban Plan in the former Yugoslav Republic of Macedonia. As per this Law, local governments are involved in the preparation and implementation of their territorial plans. Based on the national legal requirements, the Municipality of Strumica has updated building and land-use regulations to reflect hazard and risk information. Regulations for seismic protection design are included in the City's spatial town plan, its 'general urban and space planning' and lower order urban plans.

All trade companies, public enterprises, institutions and services are obligated by law to participate entirely in risk reduction and reaction to emergency situations. In addition, the business and the public sector and other institutions and households are obligated by law to acquire building or land-use permission. In order to develop area plans, or their amendments, the specific requirements of the State Administration for Protection and Rescue Plans need to be obtained.

3.5.5.2. Building codes

In Strumica, building permits are issued based on project documentation that proves the resilience of the planned construction to an expected level of VIII on the MSC scale. Furthermore, all buildings need to have necessary equipment and a crisis management plan to be able to get a building permit. All buildings need to display a certificate that shows that the property is secure and equipped with an evacuation plan and necessary recovery equipment for disasters.

3.5.5.3. Infrastructure Investment and Improvement

The Municipality of Strumica is undertaking a number of infrastructure projects to reduce disaster risks. For instance, according to the Vulnerability Assessment, the villages situated near the water basin are projected to be highly prone to floods. The Municipality of Strumica is currently building a canal to change the direction of the storm water flow and prevent flooding to these villages.

3.5.5.4. Insurance

In 2012, the former Yugoslav Republic of Macedonia joined Europa Re, the catastrophe reinsurance company in South Eastern Europe, which was further detailed in section 1.1.5.4. of this report. Europa Re's CATMonitor, the free online information portal offering: an earthquake (and later flood) risk assessment tool for estimating catastrophe risk for users' home or business; assessment of users' property catastrophe insurance needs, based on location, age and construction type of the property; subscription to disaster and extreme weather alerts; access to a learning tool about hazards in users' area through the visualization of earthquake and flood maps; and ability to report on and learn about the safety and seismic resilience of schools and hospitals in users' communities will soon be available in the former Yugoslav Republic of Macedonia[5].

3.5.5.5. Safe Schools and Health Facilities

The City of Strumica has four elementary schools, three high schools, one elementary musical school and five kindergartens. These schools, as well as the two hospitals in the city and one health institution for children with special needs, are placed either in new buildings or in older, well-maintained buildings. During the reconstruction of buildings, the Munici-

[5] More information on Europa Re is available at http://www.europa-re.com.

pality takes into consideration necessary measures to comply with seismic and fire regulations.

3.5.5.6. Post-disaster Recovery Planning

According to the City's protection and rescue plans, facilities and services are assigned to take care of citizens who lose their homes and means of living after a major accident or disaster. In case of disasters, hotels, motels, boarding houses and local committee facilities are to be used as temporary accommodation. The Municipality has plans to allocate the City's budget and find other means of financing the reconstruction of local committee facilities.

3.5.5.7. Ecosystem Services and Climate Change

According to the interviews, the Municipality of Strumica systematically cares about environment protection. The City has a modern waste disposal site. The Municipality also plans to continue with the protection of natural resources, particularly of its drinkable water and arable land through spatial planning and rational energy management. Currently, Strumica has three big artificial basins which are enough for drinking as well as agricultural use. The Municipality has future plans and also wants to encourage the construction and use of renewable energy sources, regional waste disposal, and gas and wastewater treatment plants.

Strumica has a capacity for Biomass and thermal water, which is used for agricultural purposes. Currently, the Municipality is working on a project to change heating systems used by the agricultural sector that can cause fires.

Two years ago, the City of Strumica started using natural gas, which was purchased from Bulgaria. All public buildings and schools and a proportion of households are expected to be connected to natural gas soon, thereby limiting the cutting down of trees.

3.5.5.8. Early Warning Systems

There is an early warning system at city level and one at national level. Furthermore, the Municipality plans to install early warning systems on two dams (Turija and Vodocha).

3.5.5.9. Public Awareness and Education

As previously mentioned in Section 3.5.5.2 of this report, the City of Strumica has taken public awareness and education projects into schools, as well as training for disaster preparedness against fires.

3.5.6. Challenges, Good Practices and Recommendations

The Municipality of Strumica has implemented many activities that have brought about great improvements in its disaster risk reduction and risk management. Additionally, following the big fire of 2012 the Municipality established a new programme for action in protection and rescue, updating the previous programme and replacing it with other effective solutions and activities.

The City has also benefited greatly from collaborating with international organizations, such as UNISDR's Making Cities Resilient campaign, which recognizes that climate change adaptation is part of the disaster risk reduction domain and intends to reduce the risks that vulnerable populations might encounter due to climate change and other threats and disasters. The interviews with the Municipality of Strumica show that the City is in great measure supported and helped by UNDP on these matters.

The Municipality of Strumica has undertaken many projects and has good practices that have contributed to reducing risk and preventing disasters. The construction of the City's Great Sewage Canal is an example of such good practice as it prevents floods and protects households. Another good practice is the preparation of the 'Post disaster needs assessment (PDNA) and recovery framework', in 2012. This project included analysis of the causes of the 2012 fire and offers a consolidated overview of the damages and losses, as well as identifying where the municipality needs to be improved to prevent such disasters. Many institutional bodies and experts were included during the making of this framework. The PDNA is considered to be a good starting point to develop further strategies and design plans, as well as short-term and long-term recovery programmes. For instance, according to this capacity assessment and the recovery framework project prepared in collaboration with UNDP and WHO, the City of Strumica has a medical capacity which will not be adequate for emergencies, as it has a lack of human resources and medical equipment.

Despite such successful practices and great international collaboration, the Municipality of Strumica faces a number of challenges involving risk reduction, climate change adaptation and risk management. One of the major challenges for Strumica is increasing public awareness in disaster risk reduction. According to the interviews, the residents of the City are still not aware that all sectors of society are responsible for risk prevention, reduction and management. For instance, the interviewees suggested that fire hazards could be prevented by raising awareness not to cut within the protection zone of the forest, or that floods could be prevented by not polluting and blocking the canals.

Another great challenge for the City is climate change adaptation. The Municipality is aware of the potential impacts of climate change and wants to increase its efforts and develop strategies for the City to be more energy efficient. The Municipality also wants to enhance the regional institutional capacity and coordination on disaster risk reduction and adaptation to climate change, and to strengthen the capacity of human resources to respond to emergencies. Although the City has a Risk Assessment, the interviewees stated that it would be necessary to update this Risk Assessment and the Risk Plan annually with actual data. In addition, the interviewees discussed the need to continue the rigorous application of regulations covering the construction of earthquake-resistant buildings. The Municipality also plans to make detailed plans for the restoration of historical buildings and increase their safety. In order to undertake the planning and financing of all the afore-mentioned projects and activities, the City of Strumica needs enhanced technical and financial capacities.

The interviewees envisioned receiving additional funds from the international community by showcasing good projects, which in return could provide more services for disaster risk reduction, climate change adaptation and resilience building for the City. The Municipality of Strumica would like households, low-income families, the private sector and other institutions to invest in risk reduction, to update data on possible hazards within the City's territory, to ensure educational programmes and trainings on disaster risk reduction in schools and local communities, to protect ecosystems and natural buffers to mitigate hazards and to adapt to climate change.

The Directorate for Protection and Rescue in Strumica and the Crisis Management Center affirmed their commitment to applying their best efforts at all levels in order to effectively reduce risk from disasters.

3.6. CETINJE, MONTENEGRO

3.6.1. The City Profile

Fig.3.7. City of Cetinje. *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Cetinje is a city in Montenegro, located on a karst plain close to Montenegro's Adriatic coast. The City of Cetinje has a population of 16,757 and it is the centre of the Cetinje Municipality.

3.6.2. Hazard and Risk Profile

Cetinje is affected by several hazards such as earthquakes, forest fires, floods and snow cover. The most common and important hazard for Cetinje is floods.

Earthquakes

Montenegro is located in a seismologically high-risk area and it was affected by a devastating earthquake in 1979 that killed 136 people and caused damage amounting to $4 billion. After the 1979 earthquake, many smaller earthquakes occurred, although they did not cause major damage. In early 2014, there was a smaller, magnitude 3, earthquake which caused no damage.

Floods

In Cetinje, there are as many as 200 rainy days per year. Indeed, Cetinje is considered to be one of the locations in Europe with the highest rainfall. During fall and winter months, Cetinje endures heavy rains and floods due to its geographical position.

There is an elevation difference of 100 metres between the northern and southern parts of the city. It is the southern parts that flood after heavy rains. There are urban settlements on the banks of Skater Lake, which are flooded during autumn months when the level of the lake raises.

3.6.3. Institutional Capacity for DRR and DRM

Montenegro is a republic and is divided into 21 municipalities. Following its independence from Serbia in 2006, Montenegro approved a number of laws and regulations with the aim of modernizing the old jurisdiction of the FSRY, as well as introducing new State competences (WB et al. 2008, 116). Montenegro is developing a National Platform for Disaster Risk Reduction.

In addition to the 2006 National Strategy for Emergency Situations, the 2006 Law on Rescue and Protection is the main regulation that defines the legal framework in DRR and DRM (WMO 2012, 140). The Law on Rescue and Protection enables overall adequate functioning and gives municipalities competencies to act in case of disasters. The State is to provide support to municipalities whenever it is necessary (Republic of Montenegro 2009, 4).

The Sector for Emergency Situations and Civil Security, under the Ministry of Interior and Public Administration, is the national authoritative body related to DRR and DRM. According to the Law on Local Governance and the Law on Rescue and Protection, there is decentralization of authorities, and rescue and protection services are established at the local level (ibid.). In case of major disasters and emergency situations, the State provides support to these services as well as financial support to local governments, by purchasing special equipment and training members.

In Cetinje, in relation to the new Law on Rescue and Protection, a local sector of the Government is set up in the Municipality. The former fire-fighting unit has been transformed into a Protection Service Department with 26 employees, including fire-fighters.

According to the interviews, the new law is considered to be very good. However, new bylaws, documents, plans and contracts with the stakeholders and volunteer services still need to be prepared.

The equipment levels in the Municipality of Cetinje are not considered to be adequate in relation to the existing duties and responsibilities related to DRM. Furthermore, existing facilities or equipment are not considered to be adequate for

quality response; and further education and training of staff is considered to be essential.

The Municipality of Cetinje has good collaboration with its neighbours in the region. The City has close cooperation with another municipality in Montenegro. The Sector of Civil Defense is in charge of international-level cooperation or country-wide regional cooperation. Cetinje joined UNISDR's Making Cities Resilient campaign in 2014. It is a twin city with Mali Idos, Vranje, Novo Sarajevo, Velika Kladusa, Rijeka, Shkoder, Galika, Veliko Tarnovo, Sinaia, Nafplio, Kharkiv and Gaziantep in Europe.

3.6.3.1. Budget

Local governments in Montenegro fund protection and rescue activities from their respective municipal budgets. According to the interviewee, the Protection Service Department of the Municipality of Cetinje has adequate financial support from the local government. This fund covers 27 employees' salaries, along with fuel, electricity, water and some small portion for equipment. Depending on the severity of the disaster, the national Government also provides funds. However, according to the interviews, the budget and funds in the City of Cetinje are not considered to be adequate for DRR and DRM activities. The Municipality of Cetinje receives an additional Disaster Response Emergency Fund from the IFRC (International Federation of Red Cross), which it can delegate according to emergencies. Additionally, the United States (US) Consulate in Montenegro has allocated $50,000 for emergency situations from the State Department Budget.

3.6.4. Risk Assessment and Risk Plan

According to the Law on Protection and Rescue, in Montenegro local governments in coordination with the Sector for Emergency Management are responsible for the vulnerability assessment of their respective municipalities (WMO 2012, 140).

Cetinje has a flood risk assessment and risk-reduction plan which is adopted by the local assembly. Currently, the Municipality of Cetinje is in the process of preparing its risk assessment for forest fires and earthquakes, with the support of the Government of Montenegro, the Sector of Civil Defense and Emergency Management.

3.6.5. Urban Risk Reduction and Resilience Building

3.6.5.1. Urban Planning and Development

The Municipality of Cetinje is currently starting to take into consideration risk reduction measures according to its risk reduction plan. As a new measure for risk reduction, the Municipality of Cetinje is starting to establish regulations for settlements and housing, for instance by requiring permission for new housing in flood-prone areas. Due to the accession into the EU, the building and land-use codes need to be harmonized with European standards. Building regulations are to be updated according to EUROCODE.

3.6.5.2. Ecosystem Services and Climate Change

According to the interviews, climate change is an issue that needs to be considered further and additional professional practical training is needed to increase capacity about climate change and its impacts.

The Municipality has started preparing a campaign and raising awareness about climate change and heat, in particular related to the floods that occur during the autumn and winter months. The Municipality of Cetinje is also trying to reduce carbon-dioxide outputs and to undertake a campaign to be less dependent on cars and make the city much greener. In addition to these measures, the Municipality is attempting to take some mitigating actions. For instance, during the non-rainy season, the Municipality cleans parts of the river and the lake to reduce blockages in order to better prepare for hazards.

3.6.6. Challenges, Good Practices and Recommendations

Montenegro is making changes to its institutional structure and updating laws and regulations related to DRR and DRM. The new structure is also being decentralized to local governments. However, local-level implementation is not without its challenges.

According to the interviews, coordination and the level of information is the biggest challenge for the success of DRR and DRM. Leading an emergency situation in particular is considered to be very important. Accordingly, at the national level the Sector of Emergency Management takes the lead. The Local Government has a similar structure but there is confusion as to who is really in charge. The Mayor acts as the Head in emergencies at city level. According to another law, the Government representative is considered to be the leader. In addition, the Military also has some authority, causing problems in coordination.

Another issue is the lack of disaster preparedness in planning documents such as the Sphere Standards Handbook, the Humanitarian Charter and Minimum Standards in Humanitarian Response. According to the interviewee, in the Sphere Standards Handbook there is a list of essential elements for every humanitarian response situation. They include: 1) what are minimum standards for water and sanitation; 2) minimum standards for health; 3) minimum standards for nutrition; and 4) minimum standards for shelter.

The interviewee suggested that in relation to these standards it is necessary to assess hazard and risk, to prepare planning documents, and set up systems. It is also necessary to recognize key stakeholders in the Disaster Risk Management System, involving both national and local levels. Furthermore, planning and provisions as well as scenario drills for each type of hazard are essential. In addition, social capacities need to be increased and their mobilization needs to be secured.

According to the interviewee, there are complex challenges to risk assessment that are specific to Cetinje. For instance, will the residents accept hazard information or how to implement laws? What's the most proper way to disseminate hazard information? And what is the main channel of communication that should be used? Such questions show that the main challenge in Cetinje is raising hazard and risk awareness.

Despite these challenges, the Municipality of Cetinje demonstrated good practice in emergency response during a snow-cover emergency two years ago. In this emergency, the local government had good coordination, led by the Mayor. During the emergency, the emergency body met every morning to make a plan of action for the day and every night this body met again and assessed the day. The emergency lasted for 22 days, but the two-metre-high snow cover was cleared without problem.

This successful operation and many of the future plans indicate that the Municipality is following a good course to increase its success in disaster risk reduction, climate change adaptation and disaster risk management. For future plans, the Municipality is mostly focused on disaster risk management and plans to define the hazard clearly and make plans for response, while confirming all activities with a responsible body. Nevertheless, the Municipality needs to go beyond just thinking of disaster risk management and start considering disaster risk reduction and resilience building as well. According to observations, the main challenge is awareness and the Municipality's knowledge-based capacity, which should recognize the significance of disaster risk reduction and resilience building. Further challenges are the inadequacy of technical staff and financial capacity, for instance for the implementation of European standards in urban planning and building regulations. Furthermore, public-private cooperation, public awareness and education should be developed to include residents and all stakeholders in disaster preparedness, emergency response and resilience-building activities in Cetinje.

3.7. NIŠ, SERBIA

3.7.1. The City Profile

Fig.3.8. City of Niš *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Niš is the third largest city in Serbia and the administrative centre of Nišava district. According to the 2011 census, the city has a population of 183,164 and covers 596.71 km^2. The City of Niš contributes four per cent of the Serbian National GDP (The City of Niš 2010). The territory of the City is intersected by three important international road and railway routes – several roads that connect the Balkans with Central and Western Europe, including Corridor X. The City of Niš has five municipalities.

3.7.2. Hazard and Risk Profile

The most frequent natural hazards in Niš are floods and hail. Other hazards are fires, precipitation (clouding of water-supply sources), and the onset of landslides. The biggest floods occurred in October 2007. Other major floods in Niš occurred in 2012 and 2014.

Fires

Fire threats in Niš are caused by either explosive incidents or are due to hazardous substances or forest fires caused by human factors. There are on average up to two explosions per year. The City of Niš and its surroundings have 15,147 hectares of forest land. According to the Niš Campaign Document, the burning of agricultural land and climate change are factors in forest fires (Niš Campaign Document).

Earthquakes

The Niš region is not situated in an area of increased seismic activity. The last large earthquake in this area was in 1980 and the epicentre of that earthquake was in the Kopaonik region. It measured VIII degrees on the MCS scale.

Floods

Floods pose a much greater problem to Niš. The constructed flood defences and works on the riverbed do not entirely meet safety or protection requirements, particularly due to the discontinuity of the protective embankments in places, the forming of pockets and broader unprotected areas. In certain sections, the Nišava riverbed has been altered by the forming of illegal dumps, the appearance of sand islands under the influence of both nature and human activity, as well as by the fast and uncontrolled growth of vegetation.

Landslides

There are 14 landslide hazards on the territory of the City of Niš. The torrents cause degradation of the erosive surfaces and clogging of the riverbeds and accumulations endangering settlements and traffic infrastructure. Apart from natural factors, a considerable role in erosion, especially on steeper terrains, is considered to be played by humans.

3.7.3. Institutional Capacity for DRR and DRM

The Law on Emergency Situations (*Official Gazette of the Republic of Serbia*, No. 111/09), which was adopted in 2009, has laid the foundation for putting an integrated protection and rescue system in place in the Republic of Serbia. The Serbian Government directly manages major emergency situations or those that have affected several local self-governments through the National Emergency Response Headquarters and the Sector for Emergency Management of the Ministry of

Interior. This system was implemented for the first time and proved to be efficient in the response to the Kraljevo earthquake in 2010, as well as in latter emergencies (Republic of Serbia 2013). The Republic of Serbia established its National Platform for Disaster Risk Reduction in 2013.

In accordance with the Law on Emergency Situations, at the local level the Commander of the Municipal Emergency Response Headquarters is the Mayor and the Chief Officer is the Head of the territorial Department for Emergency Management of the Sector of Emergency Management. The Law on Emergency Situations decentralizes protection and rescue activities so that local government units are responsible for the planning and organization of civil protection and for first response in emergency situations. The local self-governments have the following responsibilities and authorities related to DRR and DRM:

- enact a decision on organizing and operating of civil protection in their territory and ensure the implementation in accordance with the integrated protection and rescue system;
- enact a protection and rescue system development plan and programme for their territory, in accordance with the Long-Term Protection and Rescue Development Plan of the Republic of Serbia;
- plan and define the sources of financing for the development, construction and execution of the safety and rescue tasks and civil protection development and the implementation of civil protection measures and tasks in their areas;
- form Emergency Headquarters;
- cooperate directly with the competent authority, other governmental bodies, municipalities, commercial companies and other legal entities;
- cooperate with the regions and municipalities of neighbouring countries;
- harmonize their protection and rescue plans with the Emergency Protection and Rescue Plan of the Republic of Serbia;
- define the critical facilities, commercial companies and other legal entities of particular importance for protection and rescue;
- provide telecommunications and information support for the requirements of protection and rescue, as well as joining the telecommunications and information system of the Observation, Notification and Alert Service and connecting to it;
- prepare and adopt a Threat Assessment and Emergency Protection and Rescue Plan for their areas;
- monitor dangers, inform and provide early public warning in case of danger;
- procure and maintain alarm devices within the integrated public alert system of the Republic of Serbia, take part in preparing the acoustics study for the territory of the municipality; and
- harmonize plans for protection and rescue in emergency situations with neighbouring municipalities (City of Nis).

According to the interviews, the Municipality of Niš has adequate knowledge-base and technical capacity to address hazards affecting Niš. However, it is not equipped adequately to deal with the issues of disaster risk reduction. According to the interviews, the Municipality needs professional staff to work on these particular issues.

The member of Niš City Council is delegated for the tasks related to the estimation and reduction of risks. There is a special department within the Office of the Mayor. At the national level, the City of Niš cooperates closely with the Ministry of Interior's Department for Emergency Situations. At the International level, Niš has joined the Making Cities Resilient campaign. Niš is twin cities with Kassandra, Sparta, Glyfada, Maroussi, Alimos, Veliko Tarnovo, Kosice, Kursk, Saltdal, Bad Homburg, Krakov in Europe. The City has also signed protocols on cooperation in emergency situations with the City of Vienna and City of Sofia.

3.7.3.1. Budget

According to the Republic of Serbia's National Progress Report to the HFA, there are no regular budget allocations for DRR to local governments. According to the national regulations, municipal budgets have designated reserve funds in case of emergencies and allocation of the financial means in the budget is the obligation of local self-governments (Republic of Serbia 2013, 32).

The City of Niš allocates funds for DRR and DRM on a regular basis from the city budget. However, according to the interview with the City Councilor, this fund is not sufficient to solve the problems of seasonal floods or procurement of anti-hail rockets. According to the interview, the local government does not have adequate financial capacity.

3.7.4. Risk Assessment and Risk Plan

According to the Law on Emergency Situations, Risk and Vulnerability Assessments and Emergency Rescue and Protection Plans at Municipal levels are planned to be developed in Serbia. Data on disaster impacts are collected at local level by the local commissions or the municipal headquarters for emergency situations, applying specific protocols for damage assessment (WMO 2012, 173). The data concerning fires, floods, landslides and avalanches are generally available in a non-digital form at the municipalities (ibid.).

According to the City, Niš is the first city in Serbia to develop the comprehensive city safety strategy with the vision of an economically, socially and environmentally safe city (Niš Campaign Document). Every year the City also prepares the operative plan for the defence against the floods and selects an expert company to implement the operative plan.

The 2010 Safety document was prepared for the City of Niš with the assistance of the United States Agency for International Development (USAID). The primary goal of this project was to define the vision of a safe city. The main goals of the document were:

- Safety evaluation within the City Municipalities and at City level;
- Establishing causes for safety violation;
- Assessing the most endangered groups;
- Assessing the risk area;
- Defining the strategic goals in achieving safety in accordance with global, national and local interests and potentials;
- Defining the role of local Municipality in achieving safety;
- Establishing priority activities and projects for elevating the safety level;
- Organizing the competent services in conditions of violated safety (Niš City Strategy 2010, 11).

3.7.5. Urban Risk Reduction and Resilience Building

3.7.5.1. Urban Planning and Development

The institutional system of planning is still in development in the Republic of Serbia. The Ministry of Infrastructure is in charge of urban and spatial planning, and the Ministries responsible for Environmental Protection, Agriculture, Forestry and Water Management contribute as appropriate to the preparation of national and regional plans (ISOCARP 2008, 140). The municipalities are empowered to prepare both general and detailed land-use plans, and appoint a chief architect to implement, monitor and modify plans as a result of the reforms introduced by the Self Governance Act 2002 (ibid.).

The 2003 Law on Planning and Infrastructure Construction, which is under the jurisdiction of the Ministry of Transport, and the Law on Investment Maintenance of Residential Building regulate the incorporation of disaster risk reduction elements and building codes into the planning of human settlements (Republic of Serbia 2013). Legal subjects are obliged to build or invest in building and maintenance of public and dual-usage shelters (ibid.).

In the City of Niš, developers are obliged to make an Environmental Impact Study before any construction. In Niš, illegal construction is most present in suburbs. There are two substandard settlements on the territory of the City and both house the Roma population (Niš City Strategy 2010, 47). Vast numbers of suburban settlements do not comply fully with standards, above all regarding sewage pipes (ibid.). According to census numbers, there are 5,687 Roma in Niš. However, the real numbers are estimated to be between 25,000 and 30,000. The Roma population is living in sometimes challenging housing conditions and they are most vulnerable to the effects of hazards such as flooding (ibid., 49). Other vulnerable categories include the elderly, rural populations, refugees and internally displaced persons. Indeed, Niš has one of the highest proportion of refugees in Serbia (1.91 per cent of the total population), and most of the families (92 per cent) live in rental apartments (ibid., 48).

3.7.5.2. Infrastructure Investment and Improvement

In Niš, maintenance and reconstruction of the water management structures are used as preventive measures to regulate the flow of water against floods and ice (Niš Campaign Document). On the South Morava River, the constructed flood defence structures and the conducted works on the riverbed do not entirely meet safety or protection requirements, particularly due to the discontinuity of the protective embankments in places, the forming of pockets and broader unprotected areas (ibid., 71). In certain sections, the Nišava riverbed has been altered by the forming of illegal dumps, the appearance of sand islands under the influence of nature and human activity, as well as by the fast and uncontrolled growth of vegetation (ibid., 72).

Due to the railway and road transport corridors, the location of the airport and of SEVESO operators, the entire city population is considered at risk of exposure to technical and technological hazards (Nis Campaign Document). The four companies with SEVESO plant operators on city territory have accident protection plans and implement the necessary measures for prevention and restriction of chemical accident impact (ibid.).

3.7.5.3. Insurance

Serbia is the third shareholder country of the Europa RE catastrophe reinsurance company, which was further detailed in section 3.1.5.4. of this report. Serbia joined Europa RE in 2012[6].

3.7.6. Challenges, Good Practices and Recommendations

Since 2006, the Republic of Serbia has been in the process of building its institutional and legal system related to DRR and DRM. Decentralization and providing more authority to local governments for DRM and DRR actions such as land-use planning and building actions are part of this process. The Municipality of Niš has used its newly provided authority to establish a special department related to emergency management. However, capacity building, particularly related to professional staff building, is deemed necessary.

According to the interviewees, financial capacity is very inadequate. For instance, there is a lack of financial resources for the construction of a waste-water treatment plant, since, currently all the untreated sewerage waste waters flow into the rivers. Furthermore, funds are insufficient for resolving the problem of landslides.

6 More information on Europa Re is available at http://www.europa-re.com.

The Municipality of Niš has a City Safety Strategy document. On the other hand, even though the document indicates risks, it is a macro-risk assessment based mostly on past historic disaster impact data.

The City of Niš has an operative plan for the defence against floods, prevention, preparation works, the procurement of anti–hail rockets, the measurements of the quality of air, ground, and water which are assessed as good practices by the Municipality.

The interviewees envision improvements and future practices in disaster risk reduction and resilience building. The city's future plans are: the construction of the waste-water treatment plant; relocation of the railway tracks from the city centre; collecting data on monitoring the quality of air, land, water in real time with reports disseminated among citizens; and increasing effective implementation of its strategies by increasing enforcements.

The City of Niš has a well-developed operational strategy, particularly in relation to floods. However, these strategies are mostly based on structural interventions. In a city with many socio-economic vulnerable groups, public awareness and community-based disaster risk reduction actions should also be given importance. In addition to increasing its own professional and financial-based capacity, the City of Niš also needs to build the social capacity of its residents for the success of its disaster risk reduction and disaster risk management plans.

3.8. GAZIANTEP, TURKEY

3.8.1. The City Profile

Fig.3.9. City of Gaziantep *Author's adaptation from Wikipedia (Courtesy of Wikipedia)*

Gaziantep is a city in the south-east of Turkey. The City of Gaziantep has two administrations: province directorate and local elected municipal governments. It has nine counties, 22 municipalities and 438 villages. The City of Gaziantep has a population of 1 840,103 (Yilmaz 2014, 97). Within the last two years, the city's population further increased with the influx of Syrian refugees. Gaziantep is part of the mega-regional irrigation and hydroelectric South Eastern Anatolia Project (GAP) in Turkey, and it contributes four per cent of the country's total GDP (ibid., 97-98).

3.8.2. Hazard and Risk Profile

The most common natural hazards in Gaziantep are rock-falls, floods, landslides and earthquakes. The biggest disaster impacts in the city within the last two decades have been due to rock-falls, floods, landslides and twisters, and extreme weather conditions have been the most severe hazard to have affected Gaziantep within that period.

According to an assessment study on the earthquake hazard in Gaziantep based on attenuation relationship applications, the parameters of magnitude frequency relation, an earthquake risk was determined for the city of Gaziantep, although it was concluded that more analysis in detail was needed for possible earthquake predictions on the Northern Dead Sea Fault Zone (Cabalar 2008, 12).

3.8.3. Institutional Capacity for DRR and DRM

Turkey is a republic composed of seven regions and 81 provinces and municipalities. The 1959 Disaster Law (No. 7269) is the main legislative document relating to DRR and DRM. Turkey's Disaster Management System was reorganized after the 1999 Marmara Earthquakes. In 2009, a new department, the Disaster and Emergency Management Presidency (AFAD), was established under the Prime Ministry. AFAD is responsible for coordinating nearly all phases of disaster management including DRR at national level. It establishes rules, regulations and guidelines for the preparation of DRR plans at sub-national levels (WMO 2012). Turkey has developed its National Disaster Management Strategy, and its National Platform for Disaster Risk Reduction.

With Law no 5902, responsibilities of provincial governorships are increased. The technical and institutional capacity development of provincial governorships is being supported by AFAD. In their respective provinces, provincial governorships are delegated to assess disaster risks, prepare contingency plans, manage the provincial disaster and emergency management centre, and, at times of disasters, provide search and rescue, accommodation, food, health and other services to victims, as well as organize training activities and make accreditation (Republic of Turkey 2013, 7-8).

At the local level, all the local institutions are responsible for risk reduction. These include the Governorates, the District Authorities, the Special Provincial Administrations, the Metropolitan Municipalities and other Municipalities (ibid.).

The provincial Disaster and Emergency Department is in charge with integrated disaster and emergency management in Gaziantep, and it is responsible for all aspects of disaster risk management and coordination. Within the province, the AFAD provincial directorate is under the authority of the Governor. At the national level, it is under the authority of the Prime Minister. The legal jurisdiction and authority of AFAD is declared under Law no. 5902 (The Law on the Organization and Duties of the Disaster and Emergency Management Presidency).

The responsibility of the Provincial AFAD is:

- To determine hazards and risks and to prepare the city against disasters and emergencies;
- To implement and enforce disaster risk reduction

and emergency, response, and recovery plans of provinces, in cooperation and coordination with local administrations and public institutions and organizations;

- To manage the provincial disaster and emergency management centre, providing seamless and secure communication;
- To detect loss or damage that occurs in disaster and emergency situations;
- To make educational and training activities related to disaster and emergency situations;
- To give accreditation and certification to non-governmental organizations and volunteers related to disaster and emergency management;
- To build and manage storage units for essential search and rescue materials and tools as well as food and equipment that will be used to provide shelter, nutrition and health at times of disasters and emergency situations;
- To execute risk reduction, preparedness, response and recovery work together with other agencies and organizations within the framework of the principles and methods determined by the Presidency; and
- To conduct services related to the detection, diagnosis and purification of chemical, biological, radiological and nuclear materials and other similar technological materials and to ensure coordination and cooperation among relevant institutions and organizations.

According to the interviews, AFAD has adequate mandate and it is in charge with coordination at the provincial level. It also gives direction to municipalities, which are responsible for mitigation, preparedness and response measures (WMO 2012, 202). However, according to survey results, there is no specific unit that deals with disaster risk reduction in the local authority. In addition to the above-mentioned laws, in Gaziantep the local authority benefits from the (no. 6306) Law on Transformation of Disaster Risk Areas and the (no. 6360) Law on Amending Certain Laws and Decree Laws on the Establishment of Metropolitan Municipalities and 26 District Municipalities in 13 provinces. According to the interview with the Provincial Director of AFAD in Gaziantep, local governments have sufficient knowledge and technical capacity in disaster risk.

According to the National Response Plan, the City of Gaziantep is in a three-tiered support group with its neighbouring cities. Furthermore, depending on the degree of disaster impacts, national- and international-level reinforcement for emergencies is planned.

At the international level, Gaziantep has joined UNISDR's Making Cities Resilient campaign and has formed a new project team that is charged with looking at new international cooperation opportunities. Gaziantep is also twin cities with Duisburg, Florence, Sodertalje, Nijmegen, Karlstad and Cetinje in Europe.

3.8.3.1. Budget

In Gaziantep, each year the metropolitan municipality has to allocate at least 1/1,000 of its annual budget to its directorates to use in disaster situations. There is also an additional budget that can be approved and allocated from the central budget in order to use for plans and investment projects related to disaster and emergency situations and civil defence services. The Provincial Directorate of AFAD receives one per cent of the AFAD Directorate Budget annually.

In terms of the Transformation of Disaster Risk Areas, according to the principles outlined in the framework specifying urban renewal projects by the Turkish National Government based on the Law on the Transformation of the Disaster Risk Areas, up to 90 per cent of the revenues obtained from forest land (within the scope of 2B land) are to be allocated to urban transformation projects. As it is not considered possible to finance all urban transformation projects in Turkey from this source, 50 per cent of environmental fines, five per cent of the municipal investment budget in practice, 50 per cent of its other fees and 50 per cent of the profit that will be gained by the Bank of Provinces, as well as some of the appropriations that will be transferred by the Ministry of Finance, may be used.

However, according to the interviews this budget is not sufficient to convert all Disaster Risk Areas. Accordingly, the local government can only implement disaster risk reduction and plans within the capacity of the annual budget allocated to them, which is not considered adequate to perform all activities.

3.8.4. Risk Assessment and Risk Plan

The province of Gaziantep Earthquake Strategy and Action Plan (GADSEP 2012-2023) has been prepared within the framework of the National Earthquake Strategy and Action Plan (2012-2023), which aims to prevent potential damages by earthquakes and to prepare safe living areas against earthquakes in Turkey. In accordance with the identified strategies, necessary work continues with inter-agency cooperation.

According to the survey results, governmental organizations are the only group that actively participate in decision-making, policy-making, planning and implementation processes for disaster risk reduction in Gaziantep. Furthermore, there are no public awareness campaigns to share hazard and risk information to the community, no educational or training programmes in disaster risk reduction and no emergency drills related to hazards in Gaziantep.

3.8.5. Urban Risk Reduction and Resilience Building

3.8.5.1. Urban Planning and Development

The State Planning Organization represents a strong centralized administrative system, and it is the responsible government body in Turkey for development planning (ISOCARP 2008). The Ministry of Environment and Urbanization is the responsible body for centralized planning and physical development. According to Municipal Law no. 5393, which came into effect in 2005, local administrations are responsible for the integrity of local service management, ensuring unity of public tasks, protecting community benefits and providing local

requirements as well as preparing disaster preparedness and emergency plans. However, "[m]unicipalities have only limited development control functions" (ISOCARP 2008).

The hierarchic planning system in Turkey consists of a national five-year development plan; regional plans in some parts, land-use plans, urban improvement plans, structure plans and implementation plans. There are also special plans such as those for disaster areas and the prevention of illegal settlements. According to survey results, there are illegal settlements located within the borders of the City of Gaziantep and the lack of enforcement strategy can be considered to be the main reason behind the existence of illegal settlements and unsafe housing in the City.

Urban Renewal or Transformation of Urban Areas prone to hazards is declared under the Municipal Law. With this law, the Government defines areas that are prone to high risk and provides loans to home owners either to relocate or to rebuild. The Government provides 20-year loans at two per cent interest. In 2014, 44,000 existing housing units in risk areas were identified and 17,000 housing units were built. As part of this project, in Gaziantep, AFAD has a relocation project in eight villages prone to rock-falls.

3.8.5.2. Building Regulations

In 2007, along with the Regulation of Buildings in Seismic Zones, new standards were introduced that are related to the investigation of earthquake safety of existing structures and their strengthening. The Zoning Code and Regulations and Building Control Act, which are being implemented by the Metropolitan Municipalities, are additional regulations to secure the safety of structures against earthquakes. In Turkey, by law, there are independent audit firms to control the construction process of buildings. According to the interviews, control of the construction materials is also crucial for the safety of buildings. However, there are not enough active material labs. The law does not require construction workers to have standard knowledge and skills. Therefore, in order to reduce the cost of construction, unqualified workers are being used. There is no study that determines likely damage and casualties in an earthquake in Gaziantep.

In Gaziantep, domestic compulsory insurance coverage is available for protection against earthquakes.

3.8.6. Challenges, Good Practices and Recommendations

Turkey has developed a strong disaster management system which is decentralized down to provincial level, but coordinated by the central government. Local authorities are responsible for mitigation, preparedness and response. However, Provincial AFAD Directorates are responsible for the coordination of DRR and DRM activities. Even though AFAD has a well-organized structure, the fact that the elected local authorities have limited authority may cause problems in participatory planning and resilience-building activities.

According to the interviews, there are additional challenges to DRR and DRM practices in Turkey. The problem is not the lack of available standards and regulations. The major problem that is being encountered is the non-compliance with the requirements and applicable standards and regulations during the construction phase.

According to the interviews, in order to secure the healthy implementation of DRR actions in relation to the 'Development of the Inventory of Existing Building Stock,' a special unit needs to be established in local governments. Additionally, urban planning and land-use regulations that take into account the effects of earthquakes need to be prepared. It was also stated that it is necessary to establish a Regional Early Warning System that will cover multiple hazards and that will send accurate, reliable and understandable warnings to authorities, emergency operations centres and at-risk individuals in order to take preventive actions and reduce the possible impact of emergencies. The survey respondent also suggested that public awareness and participation is the major challenge for effective DRR in Gaziantep. Furthermore, due to the internal unrest in Syria, there is a big influx of Syrian refugees in this border town. Provincial AFAD has established four shelter areas for the incoming Syrian citizens. This vulnerable population should be considered as part of Gaziantep's effective disaster risk management strategy.

According to the Provincial Director of AFAD, disaster and emergency risk management consists of a set of steps: 1) Hazards Identification; 2) Hazards Mapping; 3) Vulnerability Loss analysis; 4) Identification of building stock; 5) Establishment of Urban Information System; 6) Determination of soil properties in detail; 7) Determination of Risk; 8) Risk mapping; 9) Preparation of risk mitigation plans; 10) Insurance; and 11) Developing a national strategy for disaster risk reduction. These steps need be performed respectively. In Gaziantep, activities have as yet only focused on the first two elements. However, future plans are to complete all these steps for a successful disaster risk management cycle.

In Gaziantep, most DRR practices and risk planning are geared towards earthquake hazards, which are a probable but not dominant threat in the region. For instance, no DRR practices and plans are mentioned for atmospheric or hydro-meteorogical hazards. Turkey is highly prone to earthquakes and there have been many steps taken, such as the National Earthquake Strategy and Action Plan, upon which Gaziantep's risk assessment is based. Multi-hazard and multi-sectoral local-level risk assessment and risk planning is essential and most crucial for successful disaster risk reduction and resilience building in Gaziantep. Furthermore, such risk assessments are to be integrated into land-use planning with an effective enforcement strategy and public awareness and participation should be encouraged for the success of DRR and DRM practices in Gaziantep.

Conclusions and Recommendations

This compendium has compiled urban risk reduction policies and activities in the selected cities of the Western Balkans and Turkey, which had joined UNISDR's Making Cities Resilient: My City is Getting Ready! campaign, through a means of interviews with local officials, surveys with local decision-makers and secondary research of existing material.

After examining the general trends in hazards, vulnerability and exposure in the urban areas of the Western Balkans and Turkey, the compendium analyzed DRR and DRM practices in eight cities: Tirana in Albania; Sarajevo Centar in Bosnia and Herzegovina; Dubrovnik in Croatia; Pristina in Kosovo*; Strumica in the former Yugoslav Republic of Macedonia; Cetinje in Montenegro; Niš in Serbia; and Gaziantep in Turkey.

Each city case study started with a brief overview of the city's profile and hazard and risk factors. The case studies examined the institutional structure that provides authority, responsibility and financial means to undertake local DRR and DRM activities, and then continued with discussing local risk assessments and disaster risk plans. As a next step, the case studies examined local risk reduction and resilience-building activities and concluded by reviewing good practices, discussing challenges and providing recommendations for the enhancement of urban risk reduction in the cities studied.

The following are general conclusions and observations on urban risk reduction in the cities of the Western Balkans and Turkey:

Hazards and Risk

All of the cities in the study are exposed to multiple hazards. Floods, earthquakes, intense rain and heavy snow, landslides, fires and storms are the most common hazards. Fires, floods and heavy snow have been named as the three most damaging disasters that have taken place within the last two decades in the cities of the region.

While fire is a climatological hazard, the onset of fires in the region has been mostly related to human activities such as illegal log cutting or agricultural burning. Likewise, flooding disasters in the region have been assessed to be a result of either: 1) intense and rapid rain and unsustainable rain control due to lack of surface water drainage; 2) blockages in rivers and lakes due to illegal dumping and surrounding illegal and/or uncontrolled urbanization; or 3) failure of dams to deterioration and out-of-date structures.

Almost all of the cities in the study are also prone to earthquake hazards, which are considered to have the potential to cause major disasters in the cities due to non-application of building codes, illegal construction and settlements, and post-construction interventions that modify the structural integrity of buildings.

Institutional Structure, Financial and Technical Capacity

The IPA beneficiary countries in SEE, and particularly those in the Western Balkans, have made major changes to their institutional and administrative structures over the last 15 years. The institutional and legal structures related to DRR and DRM in these countries have also been in transformation and the countries are setting up national strategies and plans. Indeed out of eight countries in this study, four of them have already established their National Platforms for Disaster Risk Reduction and two of them are in the process of establishing theirs.

Moreover, as part of the restructuring process due to separation from the Former Socialist Republic of Yugoslavia and becoming independent, decentralization and delegation of more authority to local self-governments is taking place. However, there is variation in the level of decentralization of functions and not all local governments yet have the same authority to undertake DRR and DRM functions; in some instances these functions are partially undertaken by a separate government body, not by the elected local self-governments. Despite this situation, all the interviewed local partners, with the exception of one, asserted that local authorities have adequate mandate, responsibility and authority related to DRR and DRM activities.

While legal structures and regulations to undertake DRR and DRM activities seem to be sufficient in cities of the Western Balkans and Turkey, technical capacity seems to be a major problem. Most of the respondents answered that their respective departments are in need of enhancement of technical capacity and equipment, particularly in relation to DRM activities such as fire-fighting and recovery and rescue operations.

In addition, lack of financial capacity seems to be the biggest challenge for local authorities in charge with DRR and DRM in cities of the Western Balkans and Turkey. Out of eight cities, only one of them stated that it has adequate financial capacity, while all others stated that financial capacity was insufficient in their cities. In most cases, DRR and DRM activities have to be financed from municipal budgets. National governments provide funds only for emergency situations, which makes it particularly hard to undertake any major urban risk reduction and resilience-building activities. Local authorities can only undertake such activities as part of other routine activities such as land-use planning using respective departmental budgets.

All cities in the compendium have joined the Making Cities Resilient campaign and they all have twin cities. Some of them (particularly Dubrovnik and Strumica) have very good collaboration, not only with regional municipalities and national governments but also at the international level, with other cities or with international organizations, some of which have been able to undertake and finance various DRR and DRM activities.

Risk Assessments and Risk Plans

All the cities in the study have conducted risk assessments, although they are not all multi-hazard based assessments and they vary in content. It is also understood that some of the risk assessments are solely hazard assessments and contain elements of spatial vulnerability and/or exposure, but not socio-economic vulnerability. Cetinje has only a flood risk assessment, although the city is in the process of developing risk assessments for forest fires and earthquakes. Gaziantep has only an earthquake risk assessment. Additionally, Niš's City Safety Strategy is based predominantly on historical data.

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence.

Most of the cities have developed work plans or DRR strategies based on their risk assessments. Tirana, Strumica and Pristina have specific strategies and proposed urban risk reduction actions based on their risk assessments. Many of the cities, such as Dubrovnik and Pristina, have also Emergency Response, Fire Protection and Evacuation Plans. In some cities, action plans are based on only single hazards, such as in Cetinje and Niš, which have flood action plans.

Urban Risk Reduction and Resilience Building

Urban planning and building regulations are the two most used urban risk reduction actions by the cities studied in this compendium. Most risk plans and risk assessment studies prohibit land-use development in hazard-prone areas. In Pristina, urban risk reduction actions are based on hazard zones; in Strumica, land-use regulations are updated; and in Cetinje, the municipality is starting to establish regulations for settlements and housing, such as by requiring permits for new housing in flood zones.

In addition, in most of the cities building codes are being updated according to EUROCODE 8 for seismic resistance. Furthermore, in some cities, such as Strumica, houses and businesses need to display their evacuation plans and fire-fighting equipment. In Niš, as per national law, legal subjects need to build and maintain shelters.

Despite the existence of regulations in cities of the Western Balkans and Turkey, problems mostly arise in implementation. Some of the cities have limited powers in planning and land-use – such as in Tirana and in Sarajevo – and partially in Gaziantep, where despite local authorities' specific powers the final decisions on land-use plans are controlled by the central government. The existence of informal settlements is observed, particularly in cities, where local authorities have limited powers. In several instances, illegal settlements are stated to have caused flooding disasters by interfering with sewage pipes or blocking riverbeds, such as in Tirana or Niš. In other instances, illegal settlements are identified as having increased fire disasters, such as in Sarajevo Centar and Strumica.

In addition to the location of settlements, compliance with building regulations is stated to be a problem in many cities, particularly those that are prone to earthquake hazards such as Tirana and Gaziantep. While there is a new structure – an independent construction audit – in Turkey, construction material and unqualified construction labour are stated to be problematic for the success of earthquake-resistant construction. In Tirana, uncontrolled urbanization, non-compliance with building codes and modification of existing structures are identified as major challenges.

Other urban risk reduction and resilience-building activities that are being used in the cities are: infrastructure updates, insurance, earthquake-resistant retrofitting of schools, emergency plans and emergency shelters, protection of ecosystems and rational energy management or renewable energy uses, early warning systems and public awareness campaigns, and education of school children and technical staff in municipalities, although the use of these actions vary in each city.

In Dubrovnik, the existing infrastructure was updated to include earthquake shock-absorption capabilities. In Strumica and Tirana, new canals were built to divert water flows to prevent flooding, and Niš is planning to maintain and reconstruct its water-management system. However, there are also challenges, particularly due to the deteriorated condition of dams, as was discussed in Tirana, or the sub-standard construction of flood defences, as was observed in Niš. The upgrade and reconstruction of this critical infrastructure is essential. However, local authorities do not usually have the necessary technical or financial capacities.

Albania, the former Yugoslav Republic of Macedonia, and Serbia have initiated the catastrophe reinsurance company, Europa RE, which plans to increase not only the penetration of insurance for households and businesses in these countries, but also awareness and knowledge on hazards through the use of its free CADMonitor. Turkey also has an exemplary Compulsory Insurance Program, which the residents of Gaziantep also use. In Dubrovnik, catastrophe insurance exists, except for drought insurance.

Cities in the study do not have post-disaster reconstruction plans. However, emergency shelters exist in most of the cities. Dubrovnik has an exemplary programme in which shelters are provided for the use of civil society associations, who are expected to join emergency operations at times of crisis. Strumica also plans to build community centres for post-disaster operations.

Early warning systems are stated to be available only in a number of cities, such as Tirana and Strumica. There are emergency drills conducted regularly in a few cities, particularly in critical facilities such as schools. Dubrovnik has an example of a good practice in this activity.

Some public awareness exists in the cities studied. However, in general it is limited to raising awareness in schools. Some municipalities train their staff on EU regulations. Some training was also conducted through city-to-city exchanges. Dubrovnik provides technical education for professionals other than municipal staff. In Strumica, there are programmes to train residents for preparedness against fires.

Climate change awareness is not common in the cities of the Western Balkans and Turkey, even among local authorities in charge of DRR and DRM practices. There are exceptions and new projects are prepared towards the changing climate and the prevention of ecosystem services. Cetinje has started a climate awareness programme; Strumica has projects on renewable energy; Tirana has plans to protect its ecosystems, such as lakes; and Dubrovnik and Niš require environmental impact studies.

Conclusion

The cities in the Western Balkans and Turkey are in the process of channeling their hazard information into action plans for risk reduction and resilience building. There are many good practices that were observed in this compendium: Tirana has a developed a work plan that includes both structural and non-structural interventions; Sarajevo Centar has successful-

ly demined its territory and started rehabilitating landslides; Dubrovnik has an innovative use of its shelters by civil society organizations which will join post-disaster actions; Pristina has recently built water collectors that have reduced flooding in the city; Strumica has exemplary collaboration on many different levels which has helped increase its technical and financial capacity; Cetinje has started climate change awareness programmes; Niš has a well-developed operative strategy for floods; and Gaziantep is undertaking urban transformation to relocate its residents against rock-falls.

Despite these good practices, cities in the Western Balkans and Turkey still encounter many challenges. The initial challenge starts from the identification of hazards and risks. Most of the cities have risk assessments. However, some are limited by the type of hazards or by the inclusion of socio-economic vulnerability assessments, which directs them to take mostly structural measures for particular hazards. The SEE region is assessed to be highly prone to the effects of climate change, and some integrated CCA and DRR measures, such as protection of ecosystem services or transformation to the use of renewable energy systems, are commonly used by the cities there. However, local risk assessment studies should also include climate change assessments and variability.

The institutional structures related to DRR and DRM are being transformed, and almost all cities agreed that they have adequate legal mandate to undertake necessary actions. On the other hand, many of the cities responded that there is a lack of technical and financial capacity in local authorities. In particular, in most cases financial capacities in local authorities were limited to emergency actions or day-to-day risk reduction activities. There are limited capabilities for major risk reduction activities, forcing cities to try to find alternative resources, such as by collaborating with international organizations. Some proactive local authorities also use the resources of private companies as well as civil organizations, particularly for post-disaster services.

In most instances, risk plans are limited due to being based on single hazard types. The interconnectedness of risk is not considered through multi-hazard scenarios, limiting potential risk actions. However, cities are starting to use multiple risk reduction strategies. Land-use control and building regulations are stated to be the two most-used risk reduction strategies, although hazard assessments are not incorporated into land-use plans in many instances.

The existence of informal settlements and the lack of compliance with building regulations are major challenges in the region. Some cities have been successful in controlling these challenges. Dubrovnik is a good example and it has adequate municipal authorities in land-use control and development, good inter-departmental collaboration and a strict urban plan which uses risk assessments as a base. At the same time there is a comprehension in many cities that, while building codes are necessary, very strict regulations may take both time and resources, and become contradictory to their purposes by leading to illegal constructions and settlements.

Other risk reduction actions are used to various degrees by the cities. Infrastructure update of critical structures is a major measure that is being used. However, financial and technical resources are stated to be a challenge in updating the war-damaged and deteriorated infrastructure in the Western Balkans. The availability of catastrophe insurance and early warning systems are limited in the region, while the availability of emergency plans and designated emergency shelter areas are common in all the cities in this compendium.

And finally, a major challenge in the cities in the Western Balkans is not only public awareness but also public participation in decision-making processes. Designated authorities should encourage urban resident participation and commitment in order to effectively implement the identified measures. City residents can be included by way of community organizations, civil society associations and representations in the decision-making process. Poor economic conditions, displaced residents and vulnerable populations – such as the Roma – are highly observed in the cities of SEE. Social measures that increase the awareness of vulnerable populations and include them in decision-making processes will particularly assure that the planned actions can indeed be implemented and result in a more successful urban risk reduction and resilience-building policy in cities of the Western Balkans and Turkey.

In addition, the close proximity of the regions' nations and cities and the trans-boundary character of hazards can be used as an opportunity rather than an obstacle by increasing regional cooperation and collaboration. This compendium shows that there are many good practices in the region, and cities in the Western Balkans and Turkey have much to learn from each other to enhance their disaster risk reduction and resilience-building practices.

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