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Diagnostic Report Emergency Preparedness and Response Assessment

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Bosnia and Herzegovina



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1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

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This document is one of five **Ready2Respond** (R2R) analysis reports commissioned by the World Bank and conducted by Prepared International (PPI) to assess the emergency preparedness and response capacities of five Western Balkan nations. Each report includes a summary of the findings and identifies key investment recommendations for each of the five R2R components. The full diagnostic report is included as annex 1; further details on data collection are to be found in annex 2.

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Abbreviations

| | |
|--------------------|--|
| CBRN | chemical, biological, radiological, and nuclear |
| CECIS | Common Emergency Communication and Information System |
| DMIS | Disaster Management Information System |
| EOC | emergency operations center |
| EP&R | emergency preparedness and response |
| EU | European Union |
| FHMI | Federal Hydrometeorological Institute |
| GDP | gross domestic product |
| GFDRR | Global Facility for Disaster Reduction and Recovery |
| GIS | geographical information system |
| INSARAG | International Search and Rescue Advisory Group |
| NATO | North Atlantic Treaty Organization |
| NGO | nongovernmental organization |
| NICS | Next Generation Incident Command System |
| OCC | Operations Communication Center |
| PPI | Prepared International |
| R2R | Ready2Respond |
| SEE-MHEWS-A | South-East European Multi-Hazard Early Warning Advisory System |
| SOP | standard operating procedure |
| UCPM | Union Civil Protection Mechanism |
| UN | United Nations |
| UNDP | United Nations Development Programme |
| UNICEF | United Nations Children's Fund |
| USAID | United Nations Agency for International Development |
| USAR | urban search and rescue |
| VAT | value added tax |
| WASH | water, sanitation, and hygiene |
| WMO | World Meteorological Organization |
| WMO | World Meteorological Organization |

Executive Summary

In 2020, the World Bank engaged Prepared International (PPI) to support the Western Balkan disaster risk management program by providing an assessment of current emergency preparedness and response (EP&R) capacities. PPI undertook **country-specific assessments of EP&R capacity in five Western Balkan nations** (Albania, Bosnia and Herzegovina, Kosovo, Montenegro, and North Macedonia) using the Ready2Respond (R2R) diagnostic methodology. Based on these findings, PPI identified priority EP&R investments at national and entity and district level. This report includes the assessment of the EP&R capacities of Bosnia and Herzegovina and the associated priority investments; a detailed investment report is published separately.

The diagnostic is an objective, data-driven foundation to engage country counterparts in EP&R development projects. The methodology builds on five core components—legal and institutional accountabilities, information, facilities, equipment, and personnel—which are further divided into 18 criteria, 72 indicators, and 360 attributes. Bosnia and Herzegovina has an overall score of 144 out of 360. Bosnia and Herzegovina is missing important elements of the EP&R system. A relevant factor identified throughout the analysis is the country's complex political and administrative structure. The country comprise two entities of similar size, the Republic of Srpska and the Federation of Bosnia and Herzegovina and Brčko district, with each its own administrative structure.

Of the five components, equipment and personnel are relatively strong, though they still require significant developments; information, facilities, and legal and institutional accountabilities on the other hand are relatively weak. Within legal and institutional accountabilities, the criterion of financial preparedness is very weak. The availability of funding varies significantly between the Brčko District, the Republic of Srpska, and the Federation, as well as between the different cantons within the Federation. A clear arrangement for budget distribution across all government levels, and especially to the municipalities, is missing, and no shared investment priorities have been defined. Legal accountability in the EP&R system shows important weaknesses. Since legislation is the base component that enables development of the other components, the incompleteness of the legislative system resonates in challenges throughout the EP&R system.

Training centers and an integrated Disaster Management Information System (DMIS) are absent, and community engagement, logistics warehouses and response stations, and shelters and open spaces are weakly developed. Currently there is no reliable warning message system in place for the public. The sirens of earlier days are nonfunctional. Although equipment received a relatively high quantitative scoring, equipment is vastly insufficient in terms of numbers and requires significantly more investments to be ready to respond to larger-scale impacts. Based on an assessment of equipment by the United Nations Development Programme (UNDP 2018a), all relevant institutions in Bosnia and Herzegovina should adopt a well-coordinated investment priority plan for equipment distribution and are advised to secure a structural budget for equipment maintenance and replacement. Overall, the system has low personnel capacity to absorb project investments. Growing the number of first responders, as well as staff working on policy, coordination, and data and information management, is urgently needed to support a maturing organization in the future.

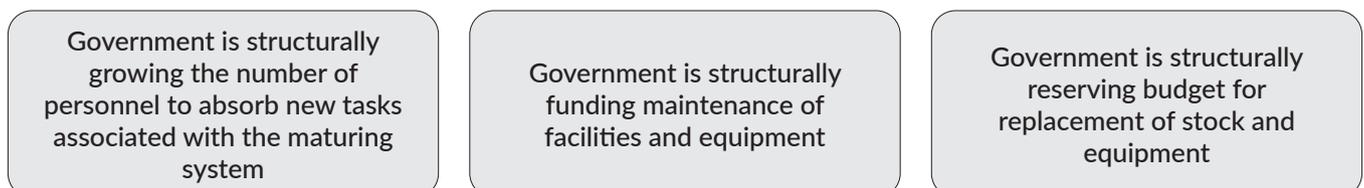
The separate investment plan includes three investment scenarios for a total of US\$98,742,000, made up of short-term investments carried out over the first year (US\$1,335,000), medium-term investments carried out over one to three years (US\$53,897,000), and long-term investments carried out over more than three years (US\$43,510,000). The investment plan also includes three sets of priorities for investments, as summarized in table 1.

Table ES1 Investment Priorities

| | | |
|---------------------------------------|--|--|
| Priority 1 20,825,000 USD | Develop legislation on protection and rescue | Legal and institutional accountability |
| | Establish interoperable operational procedures | Legal and institutional accountability |
| | Strengthen financial model | Legal and institutional accountability |
| | Implement a strengthened procurement system | Legal and institutional accountability |
| | Foster community engagement | Information |
| | Invest in early warning | Information |
| | Further develop NICS system; integrate more georeferenced data | Information |
| | Establish a multi-agency training center | Facilities |
| | Develop a monitoring system for equipment; establish equipment standards | Equipment |
| | Invest in interoperable communication equipment | Equipment |
| Develop a systematic training program | Personnel | |
| Priority 2 38,557,000 USD | Establish specialized protection and rescue unit | Legal and institutional accountability |
| | Develop alert system for the general public | Information |
| | Establish network of operational centers | Facilities |
| | Establish shelter facilities | Equipment |
| | Invest in equipment (Phase 1: US\$20,000,000) | Equipment |
| | Develop training of trainers program | Personnel |
| | Create a learning organization | Personnel |
| Record lessons from COVID-19 approach | Personnel | |
| Priority 3 39,360,000 USD | Invest in equipment (Phase 2: US\$25,000,000) | Equipment |
| | Establish warehousing facilities and stock | Facilities |

Note: NICS = Next Generation Incident Command System.

At the same time that it invests in development projects, institutions of Bosnia and Herzegovina are advised to structurally grow its personnel budget and hire and train new personnel in order to absorb the new tasks related to policy, analysis, and data management associated with the maturing system. The political leadership is advised to facilitate sufficient budget for maintenance and replacement of equipment and facilities at the end of their expected life spans. The identified priorities are based on the R2R diagnostic and first seek to strengthen the legislative and institutional frameworks to support the functioning of the other components. Identified priorities are also based on priority needs as assessed. In order to strengthen broad institutional support for investments, discussion of priorities among stakeholders is advised.

Figure ES1 Parallel Structural Budget Requirements

Introduction

The framework for Ready2Respond (R2R) was developed in reference to the role of the World Bank in disaster risk reduction. While strengthening emergency preparedness and response (EP&R) is a sound investment on its own, it also supports the World Bank Group's broader risk reduction efforts and fundamental goal of eliminating poverty and promoting shared prosperity. According to a recent World Bank report, the impact of extreme natural disasters is equivalent to a US\$520 billion loss in annual global consumption, and forces some 26 million people into poverty each year (Hallegatte et al. 2017). A functional response reduces felt consequences and enables rapid recovery, reducing cumulative impacts to public safety and the economy. Thus, ensuring capacity for emergency response protects World Bank Group investments across development sectors, as well as the development gains arising from those investments. EP&R capacity must keep pace with development and demographics to ensure these gains are not lost as a consequence of disasters and emergencies. In essence, an EP&R system with sufficient capacity is the first line of defence for World Bank Group investments and country development.

This Report

This report includes the assessment of the EP&R capacities of Bosnia and Herzegovina based on the **R2R diagnostic methodology**, as designed by the World Bank and executed by PPI. Data from the desk review¹ and key informant interviews in country² generated findings on all five core components of the diagnostic—legal and institutional frameworks, information, facilities, equipment, and personnel—which include 18 criteria, 72 indicators, and 360 attributes. In the diagnostic, these 360 attributes are scored with either 0 (not in place) or 1 (in place). Very mature and well-developed EP&R systems have all attributes in place, whereas in less mature systems various attributes will be absent.

The diagnostic identifies missing elements so that they can be acknowledged as capacity development needs and opportunities.

This report provides a summary of the EP&R capacities per component, as assessed by PPI in the first half of 2020. The full assessment report, structured in accordance with the R2R methodology, can be found in annex 1. The report also makes key investment recommendations, which have been identified for the World Bank and other stakeholders to consider as they work to strengthen EP&R capacities in the country. A detailed investment report is published separately from this diagnostic study.

Country Risk Profile

Bosnia and Herzegovina faces earthquakes, droughts, floods, and landslides. The country is particularly vulnerable to extreme precipitation and river basin flooding, which lead to very high financial losses, damage to the infrastructure, and food insecurity. More than 20 percent of Bosnia and Herzegovina's territory is prone to flooding; on average, flooding affects about 100,000 people and causes losses of about US\$600 million in gross domestic product (GDP) annually. In 2014, unprecedented rainfall affected 25 percent of the population and severely disrupted the economy. River floods inundated fields in 81 municipalities, with consequences for workers employed in agriculture, who make up 20 percent of the country's total workforce. Flooding also triggered more than 3,000 landslides, impacting nearly 15 percent of GDP. The country also faces seismic risk; its mountainous geography, aging infrastructure, and high urbanization rate compound its vulnerability to earthquakes and consequentially to landslides. A magnitude 6.0 earthquake in 1969 resulted in 14 deaths and over US\$300 million in damages. Based on current exposure, the same earthquake occurring today is estimated to cause over 400 deaths and more than US\$4 billion in damages (GFDRR 2017).

¹ A list of the documents reviewed is included in annex 3.

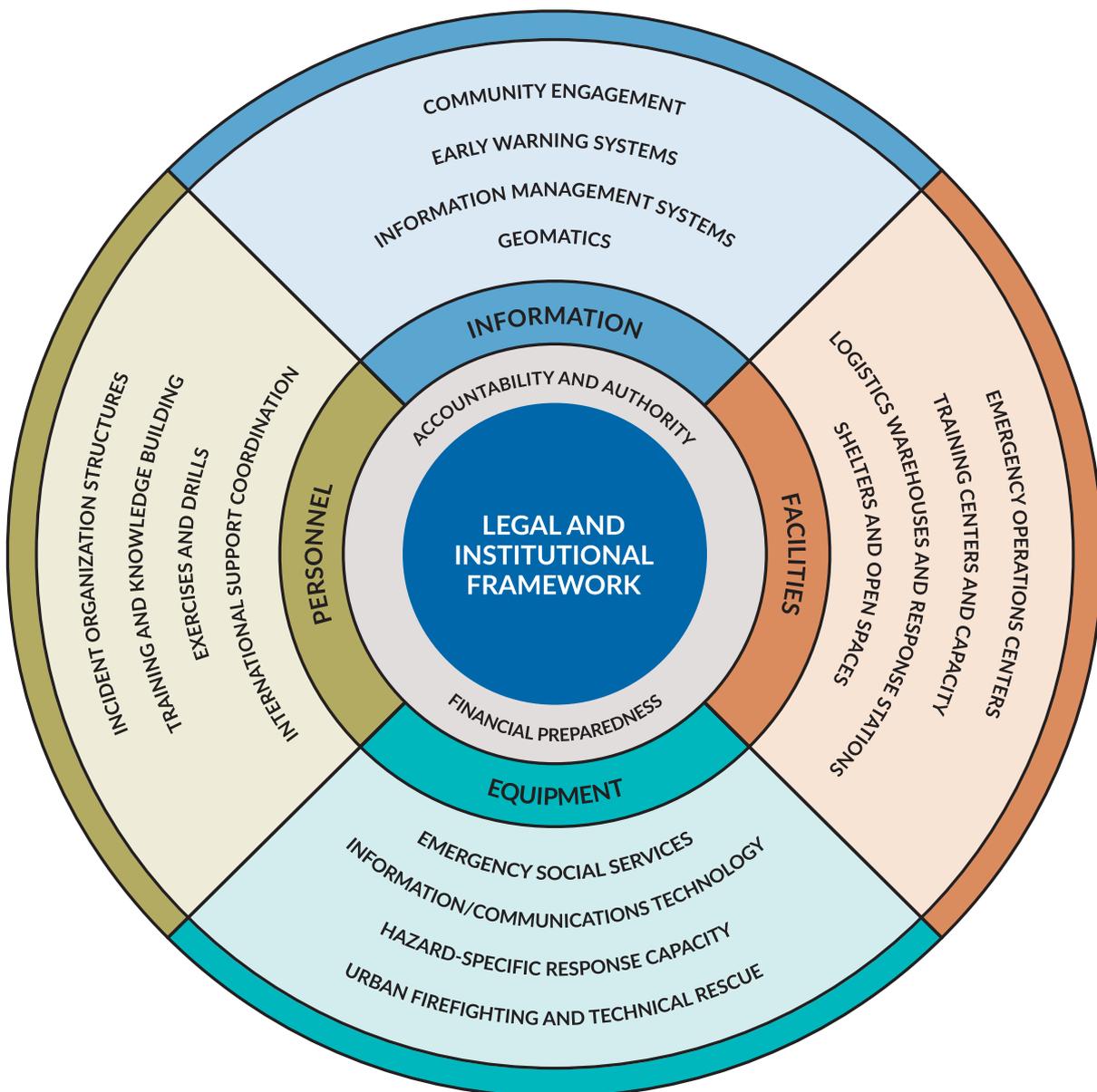
² The mission schedule is included in annex 2.

Methodology

The assessment uses the **R2R diagnostic methodology**, as designed by the World Bank. The methodology “improves national, sub-national and city resilience mechanisms and protects development gains through investments in . . . EP&R systems” (GFDRR and GSURR 2017, 5). “The encompassing City Resilience Program . . . and other World Bank resilience platforms” inform the methodology (GFDRR and GSURR 2017, 5).

The diagnostic is designed to be an objective, data-driven foundation to engage country counterparts in EP&R. The methodology builds on the five core components of emergency preparedness and response shown in figure 1: legal and institutional frameworks, information, facilities, equipment, and personnel.

Figure 1 Emergency Preparedness and Response System Core Components



Source: GFDRR and GSURR 2017.

Each component is measured by a set of criteria that addresses an aspect of a functional EP&R system for a given country. In addition, 72 indicators related to 360 attributes have been developed to score each criterion.

Overall R2R Results

As indicated, the methodology comprises 360 attributes. These represent elements that should be in place in a fully mature EP&R system. The maximum score that can be achieved is therefore 360. Bosnia and Herzegovina shows an overall score of 144. This means that 216 attributes of the EP&R system are currently absent or insufficiently in place. To support an overall understanding of the relative weakness and strength of elements in the EP&R system, the average scores for each of the five components and 18 criteria have been calculated and transposed to scales from 0 (absent) to 5 (fully in place). These are shown in table 1 and represented graphically in figure 1.

Table 1 Average EP&R Component and Criterion Scores for Bosnia and Herzegovina

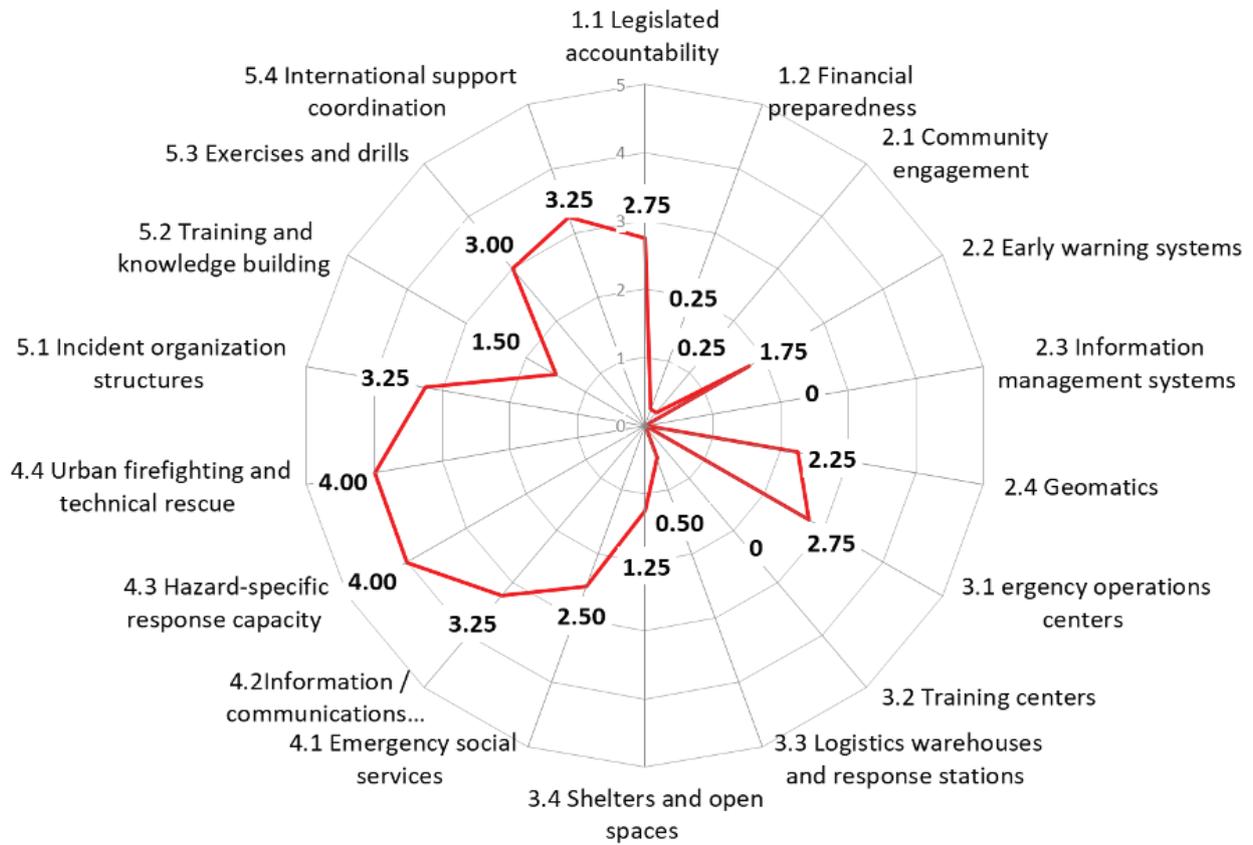
| Component | Score (0 to 5) | Criteria | Score (0 to 5) |
|--|----------------|--|----------------|
| 1 Legal and institutional accountability | 1.5 | 1.1 Legislated accountability | 2.8 |
| | | 1.2 Financial preparedness | 0.3 |
| 2 Information | 1.1 | 2.1 Community engagement | 0.3 |
| | | 2.2 Early warning systems | 1.8 |
| | | 2.3 Information management systems | 0.0 |
| | | 2.4 Geomatics | 2.3 |
| 3 Facilities | 1.1 | 3.1 Emergency operations centers | 2.8 |
| | | 3.2 Training centers | 0.0 |
| | | 3.3 Logistics warehouses and response stations | 0.5 |
| | | 3.4 Shelters and open spaces | 1.3 |
| 4 Equipment | 3.4 | 4.1 Emergency social services | 2.5 |
| | | 4.2 Information and communications technology | 3.3 |
| | | 4.3 Hazard-specific response capacity | 4.0 |
| | | 4.4 Urban firefighting and technical rescue | 4.0 |
| 1 Personnel | 2.8 | 5.1 Incident organization structures | 3.3 |
| | | 5.2 Training and knowledge building | 1.5 |
| | | 5.3 Exercises and drills | 3.0 |
| | | 5.4 International support coordination | 3.3 |

Source: R2R assessment findings.

Note. Scale from 0 (absent) to 5 (fully in place).

Equipment and personnel are relatively strong components of the R2R system in Bosnia and Herzegovina, whereas information, facilities, and legal and institutional accountabilities are relatively weak. Within legal and institutional accountability, financial preparedness is very weak. The legal accountability scores are about average relative to the other criteria. Still, these scores indicate an important weakness in the EP&R system, since legislation is the base component that enables development of the other components. The incompleteness of the legislative system therefore resonates in challenges throughout the EP&R system and should receive priority for developments.

Figure 2 Diagnostic Scores for Bosnia and Herzegovina



Source: R2R assessment findings.

Note: Scale is from 0 (absent) to 5 (fully in place).

Training centers and a Disaster Management Information System (DMIS) are absent, and financial preparedness, community engagement, logistics warehouses and response stations, and shelters and open spaces are all very weak.

Bosnia and Herzegovina is missing important elements of the EP&R system, leaving much space for further improvements. A relevant factor identified throughout the analysis is the country's complex political and administrative structure. The country comprises two entities of similar size, the Republic of Srpska and the Federation of Bosnia and Herzegovina, each with its own administrative structure. The country also includes the federal district Brčko. The 10 cantons of the Federation of Bosnia and Herzegovina although very different in capacities, form a third level of government. The regions of the Republic of Srpska carry no political or administrative responsibilities. A fourth level is formed by the municipalities: 79 in the Federation of Bosnia and Herzegovina, and 57 in the Republic of Srpska. The EP&R legal system and the availability of funding vary significantly between the Brčko District, the Republic of Srpska, and the Federation, as well as between the different cantons within the Federation. In that sense the overall scores on the country level should be perceived as overall indicators for strengths and weaknesses. The detailed sections for each component will discriminate between the different jurisdictions when necessary.

COMPONENT

1

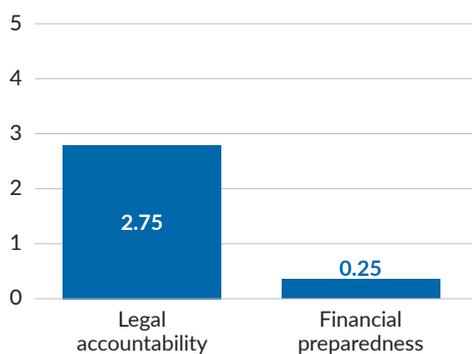
Legal and Institutional Accountability

Component Overview

Internal and external clarity about the role of various public and private agencies is critical during disaster and emergency response. Where ambiguity exists, inefficiency and jurisdictional overlap are likely, and human and economic losses may be greater than they would otherwise be.

Improving clarity about institutions' preparedness and response roles can be a potent means to improve resilience at various levels of government. Further, clarity about roles ensures that World Bank investments in capacity do not lead policy but instead that policy comes first, with financial and technical support provided at the right time to the right agency.

Figure 3 Scoring for Legal and Institutional Accountability



Source: R2R assessment findings.

Note: Scale is from 0 (absent) to 5 (fully in place).

Ideally these accountabilities are clearly enshrined in legislation with directive regulations. Where possible, uncoordinated policy instruments should identify the operational expectations for agencies assigned a preparedness and response mandate. However, even in the absence of complete organizational clarity, investment in preparedness and response can often improve a jurisdiction's ability to mitigate impacts and limit disaster- and emergency-related losses.

Component Conclusions

The results of the diagnostic indicate that development of the legislative system in recent years has progressed with some positive results. Important caveats exist, however, mainly related to lack of clarity around (delegated) responsibilities and definitions in use. The main challenge in the functioning of the system is decentralization on several levels: the national level of Bosnia and Herzegovina, the entity level comprise the Federation of Bosnia and Herzegovina and the Republic of Srpska, the Brčko District, the cantonal level, and the municipal level. The domain of protection and rescue at the National level is regulated by the Framework Law on Protection and Rescue of People and Material Goods from Natural and Other Disasters in Bosnia and Herzegovina. In the Federation of Bosnia and Herzegovina it is regulated by the Law on Protection and Rescue of People and Material Goods from Natural and Other Disasters, and in Republika Srpska it is regulated by the Law on Protection and Rescue in Emergency Situations. Pursuant to the framework law, the entity laws should be harmonized, but this has not yet been done. In addition, the definitions and terminology in the field of protection and rescue differ. According to written sources and many of the interviewees, this lack of clarity in terminology creates confusion on the operational level when decisions are to be taken because responsibilities and accountabilities are overlapping and not clearly defined. As a result, standard operating procedures (SOPs) between different actors within the system and across the different legislative levels do not align.

An assessment executed on behalf of the United Nations Development Programme (UNDP) resulted in a list of recommendations for improving EP&R-related legislation (UNDP 2018c). These recommendations, which the field mission found were still valid, include the following:

- Reform current laws in order to strengthen the prevention and preparedness dimension of the protection and rescue system.
- Clarify the coordinating role of the Civil Protection Administration.
- Regarding the issue of international cooperation, clarify that the Law on Protection and Rescue or its successor is in line with the Framework Law on Protection and Rescue in Bosnia and Herzegovina; a unique contact point with the Union Civil Protection Mechanism (UCPM) is envisaged.
- Integrate provisions in the new law that aim at establishing the conditions for a structured system of voluntarism among citizens; introduce basic elements to promote gradual establishment of volunteer civil protection organizations that would be a true part of the protection and rescue system.
- Consider establishing legal and financial solutions for extraordinary situations under a two-track budgetary system: one track for ordinary spending and development of the system, and another track for financing extraordinary situations following a declaration of state of emergency.
- At the local level in particular, focus on implementing the measures and financial provisions for strengthening administrative and operational capacity through a system of training and drills.

In response to the COVID-19 crisis, the country is currently under a declared state of emergency for the first time in its history. Under the specific characteristics of the pandemic, the lead of the national institutions seems accepted and generally appreciated, and it has proven to function well. The administration of Republika Srpska, which normally adheres strongly to its autonomous status, has been requesting support from the national institutions.³

The country lacks a single harmonized, comprehensive, and functional legal framework, one that would define the roles and competencies of the institutions responsible for managing emergencies and disasters. The country-level framework law has not been converted into consistent legislation, policies, and procedures throughout all levels of government in the different jurisdictions. It is therefore recommended that the framework law be changed so that it more strongly determines the laws throughout the country. Strengthening the legal system will allow a more coordinated, efficient, and coherent response to large-scale impacts and thus save lives and limit loss of development gains.

Risk assessments, emergency plans, and strategic development plans are mandatory for all EP&R organizations in the country, but these are not always complete, and the quality is variable. There is no central registration and monitoring of the operational procedures and response plans. The assessment could not confirm if documents are kept up to date. It was observed that organizations are unaware of the operational response plans of important partner organizations. Interagency operability is therefore not secured through procedures. The government has policies in place to support personal and agriculture financial risk transfer through the financial market, and to support reinsurance companies (World Bank 2020). Still, insurance premiums for many families are too high.

A list of infrastructure identified as critical has been established, and owners are required to draft and frequently update emergency plans. Assurance planning in general is weak, and the little reporting that is conducted is not made public. Government institutions that would typically monitor the assurance planning are not kept informed of planning activities and decisions, and enforcement is not actively pursued.

The current financial model is weak. Without regular additional investments, the system cannot continue to function adequately. According to multiple stakeholders, a clear arrangement for budget distribution across relevant institutions, and especially to the municipal level, is urgently needed to improve the system's functioning while avoiding frequent budget shortages. Clearly defined and generally accepted development and maintenance priorities should support budget use at all levels of government.

³ This finding is as of June 2020.

The entities and the Brčko District finance all civil protection activities that they plan or organize. Consequently, the financing of protection and rescue structures and operations is channeled through Federation, cantonal, and municipal budgets via a tax on employed temporary contract workers amounting to 0.5 percent of their net salaries. At the municipal level, the financing is regulated by decisions of municipal councils and hence varies greatly. In jurisdictions with greater economic activity, more funding is available for the civil protection system than in areas with less economic activity. Minimum requirements for the capacities of first responders are not established, resulting in a broad range of capacities in the different jurisdictions. Financial instruments for emergency response and early recovery are absent. There is no risk management strategy available to clarify contingent liability and to ensure short- and long-term response financing. In case of disaster, a budget line called “the solidarity fund” is available and used only in the Republic of Srpska. If additional funding for response and early recovery is required, it is improvised from other associated budget lines. In practice this improvised budgeting can be done quickly and has proven to be functional.

There is no legal framework in place that facilitates fast emergency procurement, and administrative and legal frameworks to support post-disaster budget appropriation are absent.

Insurance companies offer products to homeowners, but most homeowners cannot afford the premiums, so these products tend not be viable options. The authorities have no policies in place to support personal financial risk transfer programs.

1 Key Investment Opportunities

RECOMMENDATION 1

Implement consistent legislation on protection and rescue

The framework law thus far has not resulted in a coherent system. The first step toward improving the EP&R system in Bosnia and Herzegovina is to develop one consistent legislative system on protection and rescue. Legislative differences in the two entities and district has hindered legislative and overall system harmonization.

RECOMMENDATION 2

Establish a specialized protection and rescue unit as leverage for legislative development in Bosnia and Herzegovina

To break away from the (political) status quo in the development of legislation, legislative inconsistencies must be addressed, specifically by solving the implementation challenges related to the specialized mixed protection and rescue unit called for under the framework law. This unit has not yet been established because of flaws in the legislative system, unclear responsibilities, and a lack of accepted central leadership. The successful implementation of this mixed unit requires cooperation across legislative responsibilities as well as a more harmonized legislative system and common approach. A protection and rescue unit could therefore be instrumental in creating the needed leverage for legislative development.

Pursuant to the Framework Law on Protection and Rescue, the Bosnia and Herzegovina Council of Ministers should form a specialized mixed protection and rescue unit composed of specialized units and civil protection services of the entities, Brčko District, and other institutions, bodies, and legal entities at the country level. The unit would act in the event of natural or other disasters and participate in international exercises, relief operations, and other activities with the consent of the relevant authorities of the different levels of government.

RECOMMENDATION 3

Ensure interoperable procedures via the support of a central project unit

Risk assessments, emergency plans, and strategic development plans are mandatory, but in practice they are not always in place or kept up to date. With the support of technical assistance, a central unit should be developed to help in implementing legislated obligations in emergency and strategic planning and operational procedures. This central body could function as an academy with well-trained and knowledgeable staff to support project-based developments throughout the country.

RECOMMENDATION 4

Strengthen the financial model of sustainability

Financial preparedness for EP&R needs to be improved to avoid ad hoc decision-making and limit the variations in available budget to support emergency response units. The R2R diagnostic recommends developing a sustainable financial model for all jurisdictions and EP&R institutions. This model should have a development dimension to adapt to the needs of the EP&R actors and should consider anticipated future risks, including risks resulting from climate change, earthquakes, or further pandemics. Finally, the model should regulate the division of resources across EP&R actors.

RECOMMENDATION 5

Implement a central procurement system

Using best international practices, the country should establish emergency procurement legislation and procedures for tracking expenditure during response and early recovery.

COMPONENT

2

Information

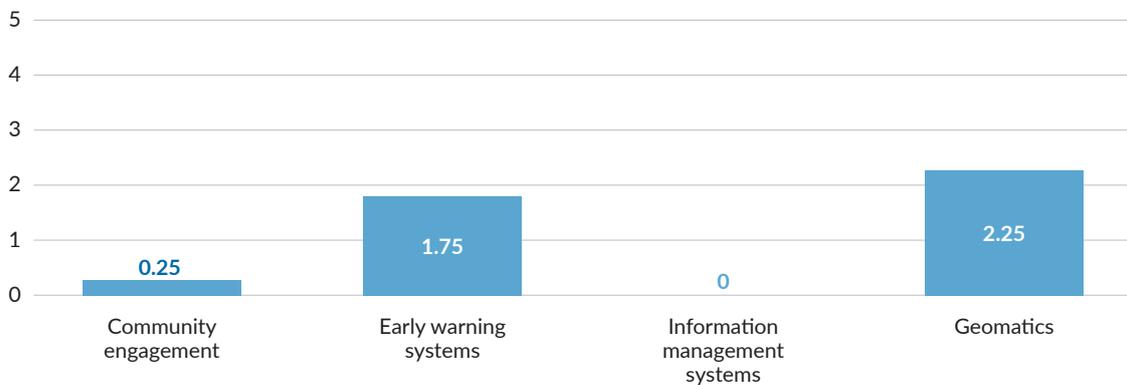
Component Overview

The collection, analysis, and swift dissemination of information enables better decision-making in advance of emergencies, during response operations, and through the transition to early recovery. Impacts from emergencies are felt locally, and so community engagement is vital to a well-developed state of preparedness.

The information used for preparedness and response includes the information generated from early warning systems; this information provides local residents—and the response teams that support them—with advance notice of emerging hazardous events. Other relevant emergency information comes from responding agencies and social media; coordination of this information ensures horizontal and vertical situational awareness that enables efficient, coordinated, and prioritized response operations.

Finally, the development of hazard and vulnerability maps along with other georeferenced emergency information, captured digitally and shared electronically, provides decision-makers with a key resource for planning across time scales to reduce risk. However, for high-quality information to have an impact, it must be utilized both by the affected community and by well-trained, committed personnel that have the appropriate equipment to respond safely and effectively to the given event

Figure 4 Scoring for Information



Source: R2R assessment findings.

Note: Scale is from 0 (absent) to 5 (fully in place).

Component Conclusions

The efforts related to community engagement and volunteering are executed by the International Federation of Red Cross and Red Crescent Societies and as part of project activities, mainly those of the joint United Nations (UN) agencies. The strong history and culture of volunteering in the country is reflected in the participation of 7,000 volunteers of the Federation of Red Cross and Red Crescent Societies. The organization hosts many first aid trainings; participation in such training is obligatory for obtaining a driving license. Government agencies have no programmatic approach to volunteering, and programs related to community education in Bosnia and Herzegovina are likewise absent. Some nongovernmental organization (NGOs) implement education programs as part of project initiatives. Activities to support small-scale community-led mitigation works are not present, but incidental support to mitigate risks via community-led initiatives does exist locally.

Early warning systems for river basins are being implemented within the framework of a UNDP project, Technology Transfer for Climate Resilient Flood Management in the Vrbas River Basin. As part of this project, risk maps are also being developed. The European Union (EU) endorsed a project in support of the Project Management Unit in Republika Srpska, which resulted in a significant strengthening of protective infrastructure as well as risk mapping to inform early warning mechanisms.

One of the challenges with the further implementation of flood protection is the lack of capacity and knowledge to draft flood protection plans, which the EU and the World Bank both see as a requirement for to sustain further development. In addition, cooperation and data exchange are hampered by the absence of measuring stations and by limited cooperation across municipalities, jurisdictions, and borders. Some hydrological stations are better equipped than others. Municipalities vary greatly in their flood risk planning.

In 2016, the World Meteorological Organization (WMO) initiated the development of the South-East European Multi-Hazard Early Warning Advisory System (SEE-MHEWS-A) with initial support from the United States Agency for International Development (USAID), Office of U.S. Foreign Disaster Assistance. There is a clear need for radar equipment in the country and the broader region. Currently the system depends on one radar station (with additional coverage provided from radar in Croatia) and on satellite information that does not allow for the precise predictions needed to support early warning. The broader region has challenges with the coverage provided by the radar network.

Currently there is no reliable warning message system in place for the public. The sirens of earlier days are nonfunctional. Messages are sent out to the population using radio and television stations, with whom the different organizations have good but informal working relations. Institutions provide services by issuing daily bulletins of the base weather stations, and they actively cooperate with institutions like the WMO.

There is no integrated data management system (DMIS) in place to support first responders' situational awareness during response activities. Some organizations have relevant information systems; but these database systems are not connected, and data are not systematically secured with backups. Currently there is no project planned to integrate the existing information databases into one system. Overall, data and information exchange between different jurisdictions is poor, in part because of the complicated and inconsistent legislative system.

An integrated geographic information system (GIS) is not in place, although the Next Generation Incident Command System (NICS) has been implemented in Bosnia and Herzegovina with the support of NATO. The NICS aims to get information as quickly as possible to first responders and the coordination center(s) so they can make fast decisions that save lives and property. This web-based system, which stores data in multiple backup locations, provides situational awareness to first responders. Although NICS is not a dedicated GIS system, it does integrate georeferenced data available to the territory, such as locations of anti-personnel mines. Continued updating and expansion of the system is an ongoing challenge for the application manager, since data exchange still needs to be improved. Digital orthographic photo maps in high resolution and recording of terrain with LIDAR (laser terrain scanning) are missing, but they would add significant value if available. The NICS system was demonstrated during the assessment at two different emergency operations centers (EOCs); it proved to be very well appreciated and of great added value for coordinating response efforts and increasing situational awareness. The use and value of the NICS system can be improved further by systematically feeding the system with additional data layers, for instance on social vulnerabilities.

2 Key Investment Opportunities

RECOMMENDATION 1

Develop a systematic community engagement approach, including sustainable volunteering programs

Bosnia and Herzegovina has a legacy of voluntarism dating back to the former Yugoslavia,⁴ and volunteering has the potential to make a systematic and permanent contribution to the EP&R system. Thus volunteering programs should be supported throughout all jurisdictions in Bosnia and Herzegovina. Structural funding to support volunteering and strengthen community engagement is required to mobilize this potential.

RECOMMENDATION 2

Support the further development of early warning systems

The WMO initiated the development of the SEE-MHEWS-A with initial support from USAID's Office of U.S. Foreign Disaster Assistance. Significant investments in equipment and knowledge building are required to achieve the ambitions of this cross-border project.

RECOMMENDATION 3

Invest in a functional alerting system for the general public

An alerting system should consist of several channels and methods. Although sirens are considered outdated in many countries, they continue to be a key method of informing the population about approaching disasters or events. Sirens should be complemented by other channels like cell broadcasting (SMS messages). Government institutions are legally required to have a multi-modular warning system for at-risk populations, but such a system has not been implemented, nor is implementation planned. This activity should be prioritized.

RECOMMENDATION 4

Create a strategy and plan of approach to store and share data relevant to civil protection organizations; further build on the potential of the nics and better integrate georeferenced data

The implementation of the NICS system has greatly increased situational awareness at the coordination level and among first responders. The sustainability of the system now needs to be further secured, and NICS should be made available to all end users. Further investments will be needed to ensure that all EP&R actors can utilize the system—specifically adapt their procedures, purchase appropriate equipment and software, and train staff in the use of the system. Linking NICS to other external information platforms such as the European Forest Fire Information System (EFISS) or the Common Emergency Communication and Information System (CECIS) of the EU could further build its strategic significance to the EP&R system.

⁴ For example, volunteer systems were introduced during the Austro-Hungarian Empire period.

COMPONENT

3

Facilities

Component Overview

Coordination of effort for EP&R activities requires a structural presence, be it for command and control, movement of emergency aid, or the staging of response teams and their equipment. These physical facilities act as a core element in establishing a culture of preparedness, ensuring a dependable common operating picture and resilient services when most other critical infrastructure and government services are disrupted. This component ensures that there is a nexus for information, personnel, and equipment as the EP&R system matures through focused investment.

Figure 5 Scoring for Facilities



Source: R2R assessment findings.

Note: Scale is from 0 (absent) to 5 (fully in place).

Component Conclusions

The Operations Communication Center (OCC)-112 is established within the Ministry of Security of Bosnia and Herzegovina. The main role of the OCC is to improve coordination within the protection and rescue system from the moment when information about the event is received until disaster response activities at the site are completed. According to the relevant rule book, the OCC acts as an information and communication center and collects, processes, and distributes data on all types of threats from natural disasters or other accidents on the territory of Bosnia and Herzegovina, for the competent institutions and bodies of Bosnia and Herzegovina, the entities, and Brčko District. The center is responsible for coordinating as needed with neighboring countries as well as international organizations. The center is not yet fully staffed and in particular lacks sufficient IT human resources.

In the entities (the Federation and the Srpska Republic) and in Brčko District, EOCs exist at the entity and cantonal/regional level. At the municipal level there is wide variation; these centers are foreseen in the law, but they are in fact often replaced by a single person with a cell phone. Only larger (and better-funded) municipalities can afford an EOC and a 112 facility. The EOC and 112 center are staffed by the same personnel and are part of one organizational structure. In case disaster capacity falls short of fulfilling both functions, additional personnel from relevant organizations will strengthen the EOC and/or the 112 center. An overview of the EOCs—on staffing, training, equipment, and functionality of all centers—does not exist, but the EU-IPA (Instrument for Pre-Accession Assistance) program has recently confirmed its funding of a study that will provide such an overview and analyze the existing gaps.

During the assessment field work, two EOCs were assessed. Both facilities were adequately equipped, and continuation of operations appears to be sufficiently guaranteed. Only in case of an incident or disaster are centers staffed 24/7. Both locations offer (improvised) facilities to house personnel for multiple days. The operational budget for the facilities is minimal. In the absence of a DMIS, the facilities lack access to sufficient statistical data to support detailed decision-making, especially during early recovery.

Bosnia and Herzegovina has no system or procedure in place to monitor social media and/or crowdsourced data. The country does have communication team members within the EOCs to interact with the media. Mobile command centers are absent, but three vehicles are used as improvised on-site operational command centers.

Apart from classrooms for theoretical training and improvised grounds where drills can be held, training facilities are absent in Bosnia and Herzegovina. First responders from the various jurisdictions occasionally travel abroad (e.g., to Croatia, Serbia, or Turkey) to participate in international trainings. As a result, first responders of different districts may be trained in different procedures and approaches. This practice is not conducive to good operational practices and interoperability within Bosnia and Herzegovina.

Logistics warehouses and response stations are absent in the country. There are, however, locations that can serve as improvised logistical hubs, like former military facilities or other logistical hot spots throughout the country. Warehouses are managed by the Federation of Red Cross and Red Crescent Societies.

There is no infrastructure in place for sheltering of displaced persons, with the exception of Brčko District, which has a limited constructed capacity of 35 persons and tents for sheltering some 500 persons. Sheltering is normally improvised on an ad hoc basis in former military barracks or in public facilities such as schools. Since temporary shelter is improvised, safety, health, and protection conditions are variable and generally below standard. The Federation of Red Cross and Red Crescent Societies owns some hygienic facilities, and the armed forces can mobilize some of its WASH (water, sanitation, and hygiene) resources. Improvement of temporary shelter facilities was identified as a priority.

No open space is specifically designated for disaster management operations, although during a state of emergency government entities can use any parcel of land for the interest of the general population and maintenance of public order.

3 Key Investment Opportunities

RECOMMENDATION 1

Invest in a stronger network of operational centers that include 112 or 121 call centers

Consider establishing a network of emergency operational centers: One at the national level at the ministry of Security. This center is already in existence but will not serve as a 112 call center. One operational center at the Federation of Bosnia and Herzegovina level, as well as in all 10 cantons. One on the entity level of Srpska and 5 centers at the regional civil protection office level, and one in the Brčko District. Establishment or further development of these facilities in a strongly connected and redundant network is recommended.

RECOMMENDATION 2

Establish a multi-agency training center

At least one centrally located multi-agency training facility should be established and equipped so the country can provide both theoretical training and practical experience in use of equipment.

RECOMMENDATION 3

Invest in fully functioning warehousing facilities and response stations

The R2R diagnostic identified an absence of warehousing facilities and logistical centers. A network of warehouse facilities and logistical hubs should be established to support emergency response activities and early recovery.

RECOMMENDATION 3

Invest in a network of predetermined shelter locations and equip these facilities with the appropriate provisions

Emergency sheltering can be organized in multiple ways. Shelter solutions that are appropriate and cost-efficient and meet internationally accepted standards should be pursued.

COMPONENT

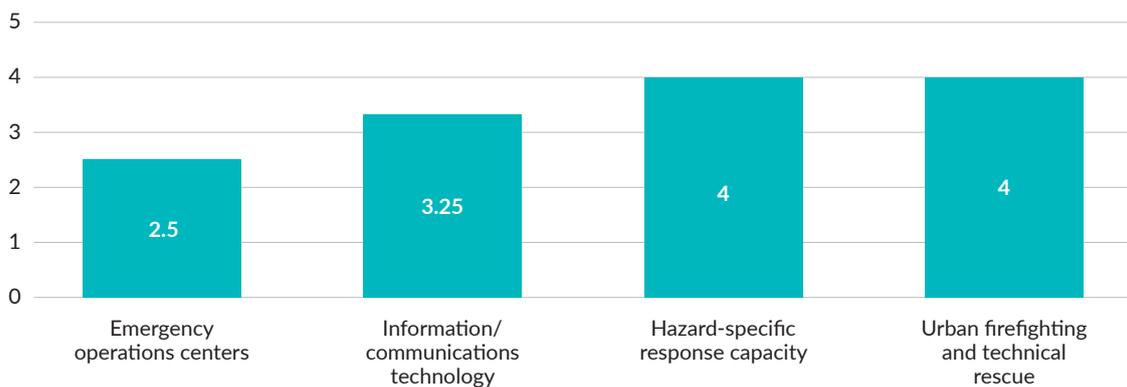
4

Equipment

Component Overview

The appropriate acquisition, use, and maintenance of preparedness and response equipment ensures timely information sharing and safe, effective rescue operations. It allows for effective communication in even the harshest conditions. Investments in equipment help governments overcome the capital requirements to ensure access to lifesaving technologies and resources. Combined with clear implementation guidance, established parts and service supply chains, and program budgets for maintenance and upgrades, these elements ensure a government's core preparedness and response agencies have the tools to safely and effectively deliver their services.

Figure 6 Scoring for Equipment



Source: R2R assessment findings.

Note: Scale is from 0 (absent) to 5 (fully in place).

Component Conclusions

In addition to key informant interviews, the study entitled Disaster Response Assessment and Roadmap for Bosnia and Herzegovina is an important source of information on equipment (UNDP 2018a, 17). Representatives of the institutions interviewed as part of the field mission also appeared to find the report a valuable resource. Prior to this UNDP study, there was no central overview on the equipment available in the country. Going forward, it will be important to create and maintain an overview of all EP&R equipment in place, with information on operational status and remaining life span. This inventory should be conducted at the institutional level and reported to relevant authorities to keep overall track of resources. Currently the country has no up-to-date information on the operational preparedness of equipment for disaster response. Bosnia and Herzegovina gets relatively high scores for equipment, since many capabilities are in place. However, available equipment is vastly insufficient in terms of numbers, meaning that significant investments are still required.

The diagnostic confirms that basic emergency social services are in place, including hospitals at regional and local level. However, the system is decentralized at the entity level and capacities differ between regions. There are no public health institutes at state level; Brčko District has one hospital; the Federation has three clinical centers, and Republika Srpska has two. In addition, there are private clinics and an adequate number of hospital beds overall. The capacities are challenged by an insufficient number of health professionals and the need for new equipment, including protective equipment. In Brčko, hospital care is limited by a lack of diagnostic systems. The COVID-19 outbreak required mobilization of capacities above cantonal level and revealed the degree to which the country depends on international support.

Ambulances and other medical vehicles for evacuation and transportation of casualties are largely available, except in Brčko. Based on operational procedures signed between the armed forces and the Ministry of Security in line with the framework law on Protection and Rescue and the Law on Defense, the armed forces can provide military medical units and helicopters (two are currently in operation) on a 24/7 basis for medical evacuation to hospitals on their request.

The COVID-19 outbreak allowed assessment of the country's disease prevention and core capacities. The diagnostic confirmed that WASH services for emergency deployment were adequate to prevent a breakdown in services. The COVID-19 pandemic marks the first time that the two entities and Brčko have joined together in a shared approach under a nationwide state of emergency.

The Federation Ministry of Labor and Social Policy, the Republika Srpska Ministry of Health and Social Welfare, other relevant social welfare institutions, and UNICEF cooperated to draft a manual on enhancing social welfare and child welfare, with a special focus on strengthening the resilience of local communities and fostering better preparedness for response to natural and other disasters. The manual pays particular attention to continuous strengthening of Social Work Centers' capacities, considering that these centers play a crucial role in protecting the most vulnerable populations, especially children (ministers of Bosnia and Herzegovina 2015, 23). Key informant interviews confirmed that specific vulnerable groups, like patients with mental health conditions, received special attention in response to recent disasters.

In practice, assistance to groups with specific needs is secured through agreements with civil society. The Federation of Red Cross and Red Crescent Societies includes specific activities for vulnerable populations within its regular activities and receives international support (including from the Swiss Red Cross and Red Crescent Society) to prepare vulnerable communities for disasters. It also operates two vehicles that are used in registration of houses of specific vulnerable groups. Other international (UN) organizations are also active in country to cater to the needs of vulnerable persons.

Protocols for storage or temporary burial of deceased persons during mass fatality events have been established. There is also a specialized approach for identification of recovered bodies during mass fatality events that is implemented consistently across the country. Although established guidelines regarding how to respect cultural and religious beliefs are absent, on an operational level the knowledge of proper and respectful practices is available and

acted upon. Safety procedures for recovery, handling, storage, and burial/cremation (or other) of bodies are available. In Brčko, a limited number of standard mortality equipment and resources is available.

hortwave and ultra-shortwave radio systems are in place. However, the R2R diagnostic identified gaps in the availability of radio communication to support emergency operations. Small communities in particular are not able to procure these systems, and parts of the country cannot be reached via ultra-shortwave radio. A network of highly active radio amateurs fills the gap, when necessary proactively, in most areas. Mobile transmitters for redundancy purposes are available, but these are not sufficient to cover the entire country. The overall conditions for interoperability, such as ad hoc systems, protocols, and agreements, are in place. Radio checks are regularly performed. Links between systems exist, and normal exchange between different parts of the country takes place. However, the interoperability of radio systems suffers from the differences between sets of radio equipment, which were donated by different institutions at different times. Civil protection personnel and firefighters work with digital radio, but these are not necessarily interoperable with the systems of the police.

The R2R diagnostic confirmed that most wildland firefighting capabilities are in place, including public initiatives to help prevent wildfires and basic capabilities, equipment, and personnel to contain localized wildland fires. The Ministry of Defense can provide additional support through helicopters (though only two helicopters are currently operable), along with other equipment and technical resources. The EU has supported building wildfire capacities, but most equipment is old, and the financial resources to update it are limited.

In the absence of a large coastline,⁵ a coast guard is not relevant for the country. However, floods are frequent in Bosnia and Herzegovina. The R2R diagnostic confirms that in general the equipment for flood protection and rescue is adequate. Units are equipped and trained, and some teams have high pumping capacity and are equipped with high-quality gear. Flood warning systems exist and are maintained; and the country has trained responders, advanced equipment, and an overall budget for floods. However, there is room for improvement in outreach and education programs to train residents of flood-prone areas in basic water rescue techniques.

The capabilities of the country's urban search and rescue (USAR) team are between medium and heavy. Through an ongoing EU project, the team will be certified and aim to follow INSARAG (International Search and Rescue Advisory Group) guidelines. Some of the required equipment is currently not in place, but the aim is to procure this as soon as possible. A water and underwater rescue team is in place. Thus the elements for rescue capacity are covered for structural collapse, including specialized training.

Medically trained rescue personnel exist for medical interventions. However, the ability to deploy the team is currently hampered by gaps in the available equipment and the absence of a systematic approach in terms of budget, deployment strategies, and training schedules.

⁵ Bosnia and Herzegovina has access to the Adriatic Sea via a 24 km long coastline near the city of Neum.

4 Key Investment Opportunities

RECOMMENDATION 1

Create an overview and monitoring system for equipment and set a standard for minimal equipment requirements

The country currently lacks up-to-date information on the availability and operational status of equipment used in the EP&R system. An inventory of all EP&R equipment, including its operational status and remaining lifespan, should be created and maintained. This inventory should be created at the institutional level and shared in order to keep track of resources and their locations.

The availability and operational status of equipment varies widely across the country. A reference for minimal equipment requirements should be created as part of an effort to strategically strengthen and grow available capacities over time. Maintenance, replacement planning, and interoperability (standardization) should be included in this strategic approach.

RECOMMENDATION 2

Invest to remedy the most pressing equipment shortages

Following the analyses, the country in close cooperation with all jurisdictions should set priorities in increasing the sets of equipment available and replacing old equipment. A clearly defined and accepted long-term plan for growth of equipment capacity, including financial planning, is key and should cover both firefighting and rescue capacity (both professionals and volunteers) including the Mountain Rescue Services, medical first responders, and the medical sector at large.

RECOMMENDATION 3

Invest in interoperable communication equipment

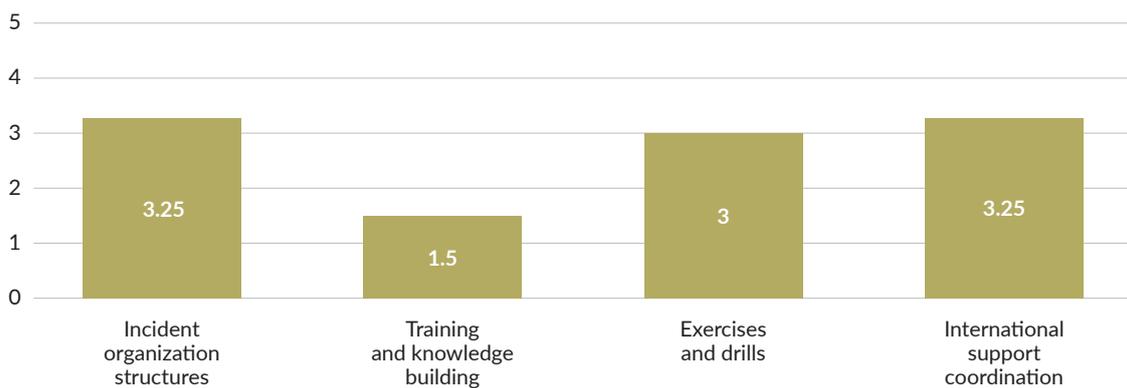
The sector should implement an international standard for communication equipment (like TETRA) in order to strengthen interoperability and make better use of the NICS at operational and incident level.

COMPONENT **5** Personnel

Component Overview

A highly skilled and experienced workforce is the most valuable resource in any disaster preparedness and response system. To achieve this, there must be a culture of preparedness in which both the public and political entities trust the agencies tasked with ensuring public safety and minimizing economic disruptions. Developing such a culture requires intensive and extensive training of those involved in EP&R so that they acquire the necessary knowledge, skills, and practical experience. Training of personnel must take advantage of the best available plans, information, facilities, and equipment to ensure an interoperable systems approach is broadly understood. It must also enable deep capability in focused areas of expertise to ensure that personnel development spreads upward, from the individual to the team, and from the team to the agency.

Figure 7 Scoring for Personnel



Source: R2R assessment findings.

Note: Scale is from 0 (absent) to 5 (fully in place).

Component Conclusions

Significant differences in personnel capacity exist in different municipalities throughout the country. Most local self-government units have adopted formal decisions regulating the organization and functioning of response agencies: decisions have been adopted by 79.7 percent of units at the Federation level, 50 percent at the canton level, and 84.5 in Republika Srpska (UNDP 2018a, 18). As a result, some local authorities are more advanced in defining emergency plans and predetermined agreements than others.

On the national institutional level, to date some 20 persons are employed by the sector for civil protection, although this number is expected to grow in response to the new Law on Protection and Rescue and the establishment of the national Operations Coordination Center-112.

Although the municipal level oversees disaster response, in the federation of Bosnia and Herzegovina it can ask the cantonal level for support when capacities are surpassed. In turn, the cantons can request support from the Federation, potentially leading to the declaration of a nationwide state of emergency.

The federal administration of Civil Protection of the Federation of Bosnia and Herzegovina is staffed by 20 public servants, while the 10 cantonal headquarters employ a total of 120 people. There are about 150 personnel employed at the administration civil protection in the Republic of Srpska; of these, 45 are civil servants, 15 are temporary employees, and 90 are contracted to work in the mine clearance program. About 100 people are employed at municipal or town level. In Brčko District a total of around 300 people are involved in civil protection, mainly in professional operational units engaged firefighting, decontamination work, the clearance of mines and unexploded ordnance, and delivery of emergency medical and veterinary assistance. These personnel numbers are from a study of 2008 but are said to be still fairly accurate. (UNISDR and World Bank 2008, 54).

The Federation of Red Cross and Red Crescent Societies is an important factor for scalability of response and is represented at all levels from municipal to national. When an emergency is declared, the Federation of Red Cross and Red Crescent Societies becomes a formal part of the system and receives requests for support from the responsible authorities.

Although SOPs exist to support the incident organization structure, including through the establishment of multiple rule books, there is room for improvement to support the responders with training materials and checklists. Knowledge management appears to be an issue for disaster preparedness, and the UNDP (2018a) roadmap recommends that all stakeholders adopt the latest methodologies and know-how on risk assessment and seek to learn more about the capacities of the other bodies involved in EP&R. In fact, the UNDP roadmap recommends regular capacity assessments to evaluate existing assets, identify deficiencies, and design appropriate measures.

Human resources are a significant challenge, and the capacities at local level are low. In municipalities with 15,000 to 20,000 residents, only three people deal with civil protection; in municipalities with 5,000 to 10,000 thousand residents, only one person does so. The UNDP (2018a) roadmap indicates deficits in personnel for response components totaling 13,546 individual staff.⁶

The R2R diagnostic found that the EP&R capacities of Bosnia and Herzegovina are deficient in training and that there are concrete needs for the development of personnel, especially for local first responders. Training programs are currently delivered by international organizations, and though these are widely appreciated and needed, a systematic training program is not in place anywhere in the country. The absence of adequate training facilities makes operational training challenging, and fragmented training initiatives hamper development of a comprehensive training program. There are differences in training practices across the country as well as gaps in training programs, including in technical dimensions. There is sufficient training for primary emergency response agencies and for nontraditional emergency roles, but there is no joint training of emergency medical technicians and no consistency in involving other EP&R actors. The Federation of Red Cross and Red Crescent Societies organizes trainings for its volunteers, but does not have its own training facilities.

⁶ The study makes the calculation based on numbers from the Union Civil Protection Mechanism.

Although training provided by international actors, including the EU and UNDP, is qualitatively good—based on experience, using best practices and international standards, and following adult learning methodologies—the lack of training facilities and the dependency on trainers from outside the country hampers a programmatic approach to training. A train-the-trainers approach would help ensure knowledge dissemination within the country but is not currently in place.

The R2R diagnostic noted the organization of multiple exercises, often in cooperation with international actors. For example, NATO supported full-scale exercises with different scenarios. The USAR team is equipped and trained as part of UCPM projects. Last year the Sava River Basin Agency currently named “Vode Srpske”, a public institution, organized exercises to evaluate its preparedness and found a gap in human resources for civil protection. Three large-scale field exercises and tabletop exercises have been organized since 2010 to check preparedness. In 2010 an exercise took place simulating a chemical attack at a Tuzla airport, requiring decontamination. In 2020, an exercise is planned in Banja Luka. Working together with civil protection experts, firefighters, and emergency medical teams, the Federation of Red Cross and Red Crescent Societies annually organizes a major exercise of a certain type of crisis at Federation, cantonal, or municipal level.

The diagnostic concludes that the impacts of exercises are weakened because objectives are not necessarily developed based on plans and specific jurisdictional risks. The results of exercise simulations are not linked with political decision-making but rather focus only on technical competencies. There is a missed opportunity to use exercises and drills to validate response plans and to identify improvements for the system.

The Ministry of Security of Bosnia and Herzegovina coordinates international assistance and is responsible for international assistance in case of disaster. When the scope and intensity of an incident affects only one entity or Brčko District, the On Site Operations Coordination Centre (OSOCC) staff can be placed in the Operations Communication Center-112 to assist in coordination response (UNDP 2016).

The Ministry of Security cooperates with competent institutions and bodies of the EU, UN, NATO, and other international institutions and organizations. In addition, Bosnia and Herzegovina has bilateral agreements relevant to EP&R with Serbia, Croatia, Montenegro, North Macedonia, and Slovenia, and has signed memorandums of understanding with the Russian Federation, Albania, Turkey, and Italy. Multiple interviews mentioned that training for political leaders would contribute to coordination of international support.

For interdepartmental coordination of receiving, sending, and transiting from international assistance for protection, there is a protocol on cooperation and identification of contact point with the UCPM. This protocol foresees a cooperation mechanism with representation from the Ministry of Security of Bosnia and Herzegovina, Ministry of Interior of Republika Srpska, Civil Protection Department of the Federation of Bosnia and Herzegovina, and Public Safety Department of Brčko District.

The R2R found no formal agreements on how to handle and receive incoming disaster aid for designated areas or on where to stage, deploy, and house incoming human resources. Host nation support following EU guidelines is in place. Policies and plans exist for donation management programs; personnel are aware of any preexisting jurisdictional agreements for handling time-sensitive air resources; and agreements have also been reached with the private sector.

The Ministry of Security channeled relief equipment, food, and non-food items to the Federation of Red Cross and Red Crescent Societies, which distributed them to the beneficiaries after the flooding in 2014. This arrangement has proven to function adequately but the approach is not laid down in a general procedure, and therefore requires an agreement by the entities in the aftermath of impact. Formal agreements with various public and private multi modal transportation operators are absent, and preexisting relationships should be formalized to avoid ad hoc solutions to logistic challenges.

5 Key Investment Opportunities

RECOMMENDATION 1

Assist the country in the development of a systematic (interagency) training program for EP&R responders

The country will greatly benefit from an interagency training program. An investment opportunity is to support an in-depth training needs assessment and then build on the identified needs to suggest new training activities in line with existing UN and EU (UCPM) standards. Such a training program should include the following curricula:

- Ongoing firefighter training for professionals and volunteers at multiple levels
- Hazmat training
- Basic and specialized training in protection and rescue
- Incident command system training on the NICS system
- Basic training in protection and rescue for the young population
- Exchange and sharing of experiences between experts
- Training (including train-the-trainers) on the international disaster response system
- International assistance and host nation support
- Evacuations
- Top-level decision-making in crisis situations and early recovery

RECOMMENDATION 2

Implement a train-the-trainers program for key personnel

Bosnia and Herzegovina needs to grow the number of certified trainers to contribute to increased training activities for EP&R actors and to allow it to continuously train incoming personnel and maintain capabilities in general.

RECOMMENDATION 3

Create a learning organization by challenging and developing operational procedures

Trainings, drills, and exercises should be organized with the aim of challenging and testing operational practices and of maintaining and further developing procedures, specifically in an interagency response setting.

Annex 1

Full Diagnostic Report

Component ① Legal and Institutional Accountability

Criterion 1.1: Legislated Accountability

Indicator 1.1.1: Emergency Management Legislation

Rationale given by the R2R diagnostic: For an emergency preparedness and response system to function well at any government scale, and especially across scales, emergency management legislation and related policy instruments must exist. These instruments must clearly assign accountabilities to specific government departments and ministries to ensure public safety service delivery and resilience.

The Council of Ministers of Bosnia and Herzegovina and institutions are responsible for protection and rescue. The Ministry of Security is the stakeholder in protection and rescue tasks and exercises this role through the Protection and Rescue Department. Under the Law on Ministries and Other Administrative Bodies in Bosnia and Herzegovina, other institutions besides the Ministry of Security are competent to participate in the protection and rescue field at the state level. These are the Ministry of Defense, the Ministry of Civil Affairs, the Demining Center (part of Ministry of Civil Affairs), the Ministry of Communications and Transport, the Civil Aviation Directorate (part of the Ministry of Communications and Transport), the Ministry of Foreign Trade and Economic Relations, the Agency for Food Security, the State Regulatory Agency for Radiation and Nuclear Security, the Statistics Agency, the Veterinary Office, and the Plant Health Protection Administration. The Ministry of Security of Bosnia and Herzegovina coordinates protection and rescue planning and operational activities of institutions and bodies of Bosnia and Herzegovina.

The results of the diagnostic indicate that developments in recent years have contributed to a stronger system. Important caveats still exist, however, related to lack of clarity on (delegated) responsibilities and definitions in use. The system is decentralized, and it functions on several levels: the level of Bosnia and Herzegovina, entity level, level of Brčko District, cantonal level, and municipal level. The domain of protection and rescue at the level of Bosnia and Herzegovina is regulated by the Framework Law on Protection and Rescue of People and Material Goods from Natural or other Disasters in Bosnia and Herzegovina; in the Federation of Bosnia and Herzegovina it is regulated by the Law on Protection and Rescue of People and Material Goods from Natural and Other Disasters; and in Republika Srpska it is regulated by the Law on Protection and Rescue in Emergency Situations. Pursuant to the Framework Law, the entity laws should be harmonized. As the laws are named differently at the state and entity levels, the definitions and terminology in the field of protection and rescue also differ.

Indicator 1.1.2: Appropriate Delegations of Authority

Rationale given by the R2R diagnostic: During disasters and emergencies, decisions must be made more quickly and often by those directly involved in managing or setting priorities for response operations. Clarity about decision-making processes, and about the ability of officials to make decisions that would typically be made at a higher government level, is vital to timely and effective disaster and emergency response.

The ambiguity in the legislative system hinders decision-making across the different decentralized systems. Efforts at cooperation frequently lead to discussions about how to interpret differences in the legislative system. Standard operating procedures (SOPs) do not align on the different legislative levels. In nearly all interviews, the ambiguity in legislation was identified as the major obstacle in the emergency preparedness and response (EP&R) system. Mention was made of the current situation, in which the state of emergency has been declared at the level of Bosnia and

Herzegovina in response to the COVID-19 crisis. Under the specific characteristics of the pandemic, the lead of the national institutions has been accepted and is generally appreciated, and so far is functioning well. Notably, the administration of Republika Srpska, which has historically not had a strong orientation toward national level institutions, is requesting support in the current situation.

Indicator 1.1.3: Agency-Specific Operational Response Plans

Rationale given by the R2R diagnostic: An operational response plan ensures that government departments with specific accountabilities for ensuring public safety will be able to fulfill those roles despite organizational challenges such as personnel turnover. It also ensures limited overlap with other government departments and, through testing the plan, enables others to become familiar with how each department will fulfill its obligations.

Risk assessments, emergency plans, and strategic development plans are mandatory for all EP&R organizations of Bosnia and Herzegovina, but these are not always complete, and their quality is variable. There is no central registration and monitoring of the operational procedures and response plans. The assessment could not confirm if documents are kept up to date. It was observed that organizations are unaware of the existence of operational response plans of important partner organizations; that plans are not actively shared among key stakeholders; and that plans sometimes don't sufficiently consider interagency coordination and cooperation.

Indicator 1.1.4: Critical Infrastructure Assurance Program

Rationale given by the R2R diagnostic: Critical infrastructure is the structural backbone of any jurisdiction. It is the core physical presence of any government, without which essential government and private services could not be provided. Typically, a significant percentage of critical infrastructure is privately owned and operated. Whether public or private, this infrastructure is of vital economic and public safety importance, so a well-developed critical infrastructure assurance program should be established across the jurisdiction.

A list of recognized critical infrastructure is established, and owners are obliged to draft and frequently update emergency plans. Assurance planning in general is weak, and the little reporting that is done is not made public. Government institutions that would typically monitor the assurance planning are not informed of the status, and adequate monitoring is not actively pursued. Critical infrastructure facilities do receive notifications from early warning systems, and their locations are mapped for use in the Next Generation Incident Command System (NICS).

Criterion 1.2: Financial Preparedness

Indicator 1.2.1: Appropriate Financial Instruments

Rationale given by the R2R diagnostic: The government's central role in natural disaster emergency response and recovery involves a large financial burden, which varies based on the government's definition of contingent liabilities related to natural disasters. Contingent liabilities refer to the spending obligations arising from past events that will be incurred in the future if uncertain discrete future events occur. Ex ante disaster funds provide the government with a predefined amount in readily available resources to be used in the aftermath of a natural disaster. Ex ante funding includes the financial allocations, budget contingencies, emergency reserve funding mechanisms, and insurance instruments that exist to support effective preparedness, response, and early recovery.

By law, the entities and the Brčko District finance all civil protection activities that they plan or organize. In the federation, the financing of protection and rescue structures and operations is channeled through cantonal, and municipal budgets, and through a tax on employed temporary contract workers amounting to 0.5 percent of their net salaries. At the municipal level, the financing is regulated by decisions of municipal councils and as a result varies greatly. A clear arrangement for budget distribution across all government levels, and especially to the municipalities, is missing, and no shared investment priorities have been defined.

Financial instruments for emergency response and early recovery are absent. There is no risk management strategy available to clarify contingent liability and to ensure short- and long-term response financing. In case of disaster, a budget line called “the solidarity fund” is used. If additional funding is required, it is improvised from other related budget lines. In practice this improvised budgeting can be done quickly and has proven functional.

Indicator 1.2.2: Emergency Procurement Systems and Frameworks

Rationale given by the R2R diagnostic: Within disaster relief logistics, procurement accounts for a substantial percentage of total expenditures. Good procurement practices are essential for efficient, effective, transparent, and accountable governance and project management in emergency disaster response. Proactive procurement forecasting identifies the goods and services required for effective disaster response by stockpiling and forming vendor partnerships to ensure rapid distribution in emergency situations. Decentralized, fast-track response procurement procedures incorporate more flexibility and invoke other mechanisms (such as prequalification processes) to minimize serious supply delays, reduce costs, and speed up delivery times.

To facilitate the procurement of equipment, amendments to the Law on Customs Policy of Bosnia and Herzegovina have been adopted. Equipment for safety and rescue and firefighting is exempt from import duties on equipment purchased or obtained through grants. Procurement is not centralized, and procurement forecasting and planning are absent in the country. There is no legal framework in place to facilitate fast emergency procurement.

Indicator 1.2.3: Public Financial Management Policies and Procedures

Rationale given by the R2R diagnostic: Effective financial management policy outlines and provides guidance on the processes involved in managing response costs during the activation of the emergency response structure and protocols. It outlines those responsible for managing response expenditures for costs incurred during response and recovery as well as the relevant expense authorities and applicable thresholds. Financial management procedures outline the scope, steps, and responsibilities for financial tracking of all eligible and approved emergency response costs, authorizations of those expenditures, and processing of invoices.

Administrative and legal frameworks for post-disaster budget appropriation are absent in Bosnia and Herzegovina.

Indicator 1.2.4: Personal Financial Risk Transfer Programs

Rationale given by the R2R diagnostic: An established personal insurance market that is affordable and available in high-risk areas can significantly reduce the financial burden on individuals, families, and governments in the wake of disasters and emergencies. In combination with other government risk-transfer mechanisms, a robust personal insurance market can significantly reduce government contingent liability while also improving personal accountability and preparedness of individuals and families.

Government authorities have no policies in place to support personal financial risk-transfer programs. Insurance companies do offer products, but these tend not to be viable options because they are not affordable for the public.

Component 2 Information

Criterion 2.1: Community Engagement

Indicator 2.1.1: Program for Local Level Volunteer Emergency Responders

Rationale given by the R2R diagnostic: Local responders are the first to act. However, if no systems are in place to engage with local volunteers in advance of an emergency, managing disaster response becomes more difficult. It is helpful to engage with volunteer responders early to maximize response effectiveness, significantly reduce response times, and encourage individual accountability for personal and family preparedness.

The main efforts related to community engagement and volunteering are executed by the International Federation of Red Cross and Red Crescent Societies or as part of project activities of the joint UN agencies. The strong history and culture of volunteering in the republic is reflected in the existence of 166 Red Cross and Red Crescent Societies suborganizations, and in the high number of volunteers (7,000) and professional staff (400). The Red Cross and Red Crescent Societies organizes many first aid trainings; participation in such trainings is obligatory for obtaining a driving license. The organization frequently trains 40 multi-use response teams in first aid and water purification, among other areas. Government agencies have no programmatic approach to volunteering.

Indicator 2.1.2: Program for Community Education

Rationale given by the R2R diagnostic: Addressing preparedness and response at the local level can raise awareness of specific threats and help communities to prepare and engage in problem solving prior to and during a disaster. Further, these programs ensure communities know what local action to take when warnings are issued and thus reduce pressure on response services during widespread and/or more intensive disasters and emergencies.

Programmatic community education in Bosnia and Herzegovina is currently absent. Some nongovernmental organizations (NGOs) implement education programs as part of project initiatives.

Indicator 2.1.3: Program to Support Small-Scale, Community-Led Mitigation Works

Rationale given by the R2R diagnostic: Mitigation of risk at the local level with support from the community helps raise overall risk awareness while reducing the effects of a disaster and promoting rapid recovery following an event. Examples might include retrofitting irrigation equipment for secondary use in wildland fire suppression, local riverbank stabilization, etc.

Programs to support small-scale community-led mitigation works are not present, but incidental support to mitigate risks via community-led initiatives are said to exist locally.

Indicator 2.1.4: Education and Tools for Local Leaders

Rationale given by the R2R diagnostic: Local leaders, elders, and community groups have an important role to play in overall disaster risk reduction. Engaging and training the community leadership in proactive risk management can improve the overall effectiveness of the emergency management program in all phases, ensuring integration with all levels of government and establishing a local culture of preparedness.

Outside of the activities of the International Red Cross and Red Crescent Societies and UNICEF, no initiatives were identified that support local leaders with education material and tools. Relevant organizations occasionally improvise within their networks to assist communities with educative programs, particularly in the field of hygiene and disease prevention.

Criterion 2.2: Early Warning Systems

Indicator 2.2.1: Functioning Monitoring/Surveillance Program

Rationale given by the R2R diagnostic: Monitoring and surveillance mechanisms and the ability to disseminate the information they generate are the foundation of an effective early warning system. Ideally, there should be an existing system that allows for the prediction and forecasting of potential hazards, grounded in sound science and technology. This system should be able to operate 24 hours a day, seven days a week. Ongoing and frequent monitoring and surveillance of hazards increases the likelihood of accurate and timely warnings. Since there are multiple hazards, there should be a certain level of coordination across sectors/ministries in order to understand and possibly leverage existing monitoring and surveillance systems.

The **Federal Hydrometeorological Institute** of the Federation of Bosnia and Herzegovina (FHMI) is an institution at the entity level that directly cooperates and coordinates with different ministries. FHMI is an independent institution under the umbrella of the Federation of Bosnia and Herzegovina. According to the law, FHMI carries out activities in relation to permanent monitoring in the area of meteorology, hydrology, quality of environment, seismology, and astronomy; performs atmospheric research and research on water resources, quality of environment (air, water, soil), seismic processes, and astronomic phenomena; and collects, processes, analyzes, and publishes relevant data for the territory of the Federation of Bosnia and Herzegovina.

The **Adriatic Sea Watershed Agency** was established in accordance with the Law on Waters and as of January 1, 2008 is a legal successor of rights and obligations of the public company Adriatic Sea Watershed Region. The agency's mandate covers the Adriatic Sea watershed and basins for the Neretva, Cetina, and Krka Rivers on the territory of the Federation of Bosnia and Herzegovina. The agency's head office is located in Mostar. Its work and operation are defined in the relevant decree on types and content of the adverse water impact protection plans (adopted in 2009) and in the Federal operational plan for protection from floods (adopted in 2011).

The **Sava River Watershed Agency Sarajevo**, is established by the Law on Waters and has its head office in Sarajevo. The agency manages the water basin that is part of the international River Danube basin (part of the international subbasin of the River Sava) on the territory of Bosnia and Herzegovina, or Federation of Bosnia and Herzegovina.

The Sava River Watershed Agency implements measures for preventive and active defense from floods, not only when there is an immediate threat of high waters, but also during and after floods. Flood areas with constructed water facilities are located along the River Sava, and further downstream of the River Bosna. These facilities are owned by the government of the Federation of Bosnia and Herzegovina, and the management authority was transferred to the agency by the decision of the Federation government.

In 2013 the government of Republika Srpska transformed the water management institutions and formed the public institution Vode Srpske, a merger of the Sava River Watershed Agency Sarajevo and the River Trebišnjica Watershed Agency. The new institution has its head office in Bijeljina and its employees are from public companies of Republika Srpska. In accordance with the Law on Waters of Republika Srpska, public institution Vode Srpske manages waters, public water resources, water and hydro-technic facilities and systems, rivers, springs, and lakes in Republika Srpska. The Public institution Vode Srpske is responsible for water management in the region and the river basin. It also carries out the work of the water management branch offices; proposes long-term and medium-term plans and programs for water management development; manages generation and allocation of funds; monitors realization of the water management development plans and programs; controls appropriate use of funds; proposes the amount of compensation fees; proposes annual activity plans and financial plans; proposes criteria and measures for allocation of funds; and carries out other duties in accordance with the law and other regulations of Republika Srpska and Bosnia and Herzegovina. The Law on Waters of Republika Srpska more specifically regulates and describes the responsibilities of this institution.

The activity of the Republic Hydrometeorological Institute of Republika Srpska is defined by the Law on Meteorological and Hydrological Activity, the Law on Seismic Activity, and the Law on Protection of Air. This institute consists of a meteorology department (with a monitoring section and section for climatology and agrometeorology), a hydrology department (with a hydrology section and an ecology section), and a seismology department (with a section for

observational seismology and section for instrumental and engineering seismology). The institute also has a financial and legal affairs department.

The **Republic Hydrometeorological Institute of Republika Srpska** is one of two equal hydrometeorological institutes at the entity level in Bosnia and Herzegovina. It was founded in accordance with the Law on Ministries, which defines it along with six other republic administrative organizations. According to this law, the Republic Hydrometeorological Institute of Republika Srpska performs professional and other duties in relation to the following: development and functioning of hydrology, meteorology, and seismology; research on atmosphere, water resources, air and water quality, and seismic processes; collection and publishing of hydrometeorological and seismic data of interest to the Republic; and other activities related to hydrology, meteorology, and seismology. The institute performed its tasks as an independent Republic administrative organization, until October 8, 2002, when under the Law on Ministries it began to operate as part of the Ministry for Agriculture, Forestry and Water Management.

The government of Republika Srpska adopted the Decree on Organization and Mode of Operation of the Monitoring, Information and Warning System.

Article 159 of the Law on Protection and Rescue in the Federation of Bosnia and Herzegovina establishes civil protection 112 centers. The article cites the need to collect data on phenomena and threats that can lead to a disaster and on consequences of disaster for people and material goods. It also cites the need to process and distribute such data to responsible authorities and legal entities, and transfer orders from the civil protection headquarters at the time of their operation.

The Ministry of Security hosts the Bosnia and Herzegovina 112 Operations Communication Center, which is currently not linked to the Common Emergency Communication and Information System (CECIS) of the European Commission. Bosnia and Herzegovina is preparing to participate in the UCPM. In this context, there is still a need for more systematic horizontal cooperation and enhanced vertical coordination, including for standardization and methodologies applied. More specifically, there is a need to establish the 112 European emergency number (for police, ambulance, and firefighters), and—as a precondition for connecting to CECIS—to gain access to the Secure Trans European Services for Telematics between Administrations (sTESTA). Strengthening of governance, supported by legislation and capacity building, is needed to drive the implementation.

The early warning and disaster risk reduction system is fragmented and inefficient. When a flood has been forecast, all hydrological stations submit data daily to the River Sava Water Agency in the Federation and Vode Srpske in the Republic of Srpska. When water levels reach the predefined threshold level for which a state of emergency must be declared, the data are submitted every four hours until the emergency has ended. Early warning systems for river basins are being further developed within the framework of a United Nations Development Programme (UNDP) project, Technology Transfer for Climate Resilient Flood Management in the Vrbas River Basin. As part of the project, risk maps are being developed. The European Union (EU) supported a project in support of the Project Management Unit in the Republika Srpska, which resulted in significant strengthening of protective infrastructure as well as risk mapping to inform early warning mechanisms.

One of the challenges with the further implementation of flood protection is the lack of capacity and knowledge to draft flood protection plans, as the EU and the World Bank both identified as crucial in order to enable further developments in flood protection. In addition, the lack of measuring stations and lack of cooperation by the many municipalities involved (across different jurisdictions and borders) complicate cooperation and data exchange. Some hydrological stations are better equipped than others. Some municipalities are said to be more active in flood risk planning than others.

In 2016, the World Meteorological Organization (WMO) initiated the development of a South-East European Multi-Hazard Early Warning Advisory System (SEE-MHEWS-A) with initial support from the United States Agency for International Development (USAID), Office of U.S. Foreign Disaster Assistance. There is a clear need for radar equipment in the country and in the broader region. Currently the system depends on one radar station, with additional coverage provided by radar in Croatia. Satellite information is also available, but it does not allow for the precise predictions needed to support early warning. The broader region is said to have challenges with the coverage of the network of radar stations.

Indicator 2.2.2: Sound Data Analysis Program

Rationale given by the R2R diagnostic: The analysis of data gathered by monitoring and surveillance systems is crucial to any early warning system. The data gathered should be analyzed using scientifically and technologically sound methodologies to ensure that the information being disseminated is accurate, useful, and timely.

There is no integrated data analysis system present in Bosnia and Herzegovina, but some agencies have decent monitoring and reporting capacities. The River Sava Watershed Agency carries out automated hydrological monitoring (water levels and precipitation) with a network of about 80 measuring stations, located on the main watercourses of the Sava watershed. All key data are available to the public on the agency's website.

The longer-term goal is to have a fully developed SEE-MHEWS-A system that will support the Meteorological and Hydrological Services in fulfilling their core function: providing timely and accurate warnings of hazardous weather events in order to reduce loss of lives and other impacts on people, infrastructure, and industry. The second phase of the SEE-MHEWS-A project, which began in 2018, entails the actual implementation of the system. Training and capacity building should support the implementation of the system.

Indicator 2.2.3: Real-Time Warning Messages

Rationale given by the R2R diagnostic: Functional early warning systems deliver clear, simple messages containing useful information to affected or at-risk populations. This information empowers individuals and communities to act and adopt protective behaviors that save lives. Messages need to be straightforward and action oriented. They should be consistent across multiple media platforms and message delivery systems.

Currently, there is no reliable warning messaging system. The sirens installed during the socialist period are nonfunctional, and messages are sent out to the population by radio and television stations (with whom the different organizations have good working relations). Institutions provide services by issuing daily bulletins from the base weather stations and weather forecasters, and they actively cooperate with institutions like the World Meteorological Organization.

Royal Haskoning DHV was part of the project team developing a forecasting and early warning system for five Eastern European states in the Sava River basin to improve resilience to flooding or drought. The results of this project have not yet been made public, but the study identifies key investments needed to develop capacities of the early warning systems. One of the observations of the project is that investments in measuring equipment should be linked to organizational development. Currently the connections between the organizations are said to be weak. Processes for data collection, storage, management, analysis, and interpretation, as well as for issuance of warnings to professionals and the public, are not clearly defined and are too bureaucratic.

Indicator 2.2.4: Functional Warning Message Distribution Systems

Rationale given by the R2R diagnostic: Critical early warnings based on sound analysis and high-quality data are effective only if delivered rapidly to the population at risk. To be effective in reaching the target population, warning messages must be delivered near simultaneously across multiple media platforms, such as television, radio, social media, and mobile phone text message. By ensuring "last mile" connection for early warnings, at-risk populations are able to take lifesaving actions within the community to reduce the consequences of disasters and emergencies.

A multimodal warning system from government to at-risk populations is legislated but not implemented. The Rule Book on organization and functioning of the civil protection operations centers defines unique warning signals for the territory of the Federation of Bosnia and Herzegovina, and calls for their use in the way and under conditions set. Transmission of the alert signal (general alert and termination of danger) is performed by the municipal civil protection operations centers using sirens intended for this purpose. Transmission of a general alert is activated when civil protection operations centers get data on an impending threat or occurrence of an accident that may jeopardize or

has jeopardized the lives and health of people in a certain area. The order for transmission of the signal is given by the head of the civil protection service, or by someone appointed by him or her.

There is no project defined to implement a system at this time. Capacity and funding are said to be insufficient.

Criterion 2.3: Information Management Systems

Indicator 2.3.1: Functional Information Management System

Rationale given by the R2R diagnostic: The use of a common Disaster Management Information System (DMIS) by all emergency management personnel improves overall situational awareness, decision-making, and response coordination. A system based on commercial off the-shelf (COTS) software that is interoperable with common systems in use by international agencies can improve overall response and increase training opportunities for personnel across agencies.

There is no integrated information management system available to support emergency management activities. Some organizations have some information, but the databases are not connected and readily available to support emergency coordination.

Indicator 2.3.2: Budget Allocations for Information Systems

Rationale given by the R2R diagnostic: A functional Disaster Management Information System (DMIS) fills a crucial role in supporting situational awareness and organizing information prior to and during a disaster. It is important to ensure that the system is maintained, updated, and upgraded as necessary so that it functions appropriately and valid information is available when required.

Currently there is no project planned to integrate the existing databases into one system. Data and information exchange between different jurisdictions is poor, partly because of the complicated and inconsistent legislative system.

Indicator 2.3.3: Integration of GIS-Generated Data in DMIS

Rationale given by the R2R diagnostic: The availability of geolocated information within the DMIS provides superior situational awareness for planning, mitigation, response, and recovery efforts. Real-time updates of GIS data, often using mobile and wireless device users, provide current data for disaster and emergency response and recovery planning.

Bosnia and Herzegovina has no DMIS and hence no system integrating GIS-generated data in DMIS.

Indicator 2.3.4: Integration of Early Warning Data in DMIS

Rationale given by the R2R diagnostic: Early warning systems provide data that are crucial for analyzing the potential impact of an incident. The integration of early warning system data with the DMIS enhances situational awareness and allows for the dissemination of a comprehensive common operating picture for all responding agencies.

The indicator is not applicable since Bosnia and Herzegovina does not have a DMIS.

Criterion 2.4: Geomatics

Indicator 2.4.1: GIS Capacity

Rationale given by the R2R diagnostic: GIS can be a powerful tool for planning, preparedness, response, and recovery by organizing and making available information on hazards, vulnerabilities, and resources for emergencies. GIS can also be a powerful tool in promoting public risk reduction by helping populations better understand current risks.

The Next Generation Incident Command System has been implemented in Bosnia and Herzegovina with the support of NATO. This project aims to get the right information as quickly as possible in the right hands and allow for fast decision-making to save lives and property. The web-based system provides situational awareness to first responders. Although NICS is not a dedicated GIS system, georeferenced data available to the territory, such as locations of anti-personnel mines, are integrated in the NICS system. Continued updating and expansion of the system is an ongoing challenge to the application manager, since data exchange still needs to be improved. Digital orthographic photo maps in high resolution and recording of terrain with LIDAR (laser terrain scanning) are missing but could add great value. The NICS system was demonstrated during the assessment at two different emergency operations centers (EOCs); it proved to be very well appreciated and of great added value for coordinating response efforts and increasing situational awareness. Pictures taken at different impact sites in the field can be uploaded and displayed in the EOCs instantly, assuming internet access is available.

Indicator 2.4.2: Georeferenced Data Layers

Rationale given by the R2R diagnostic: Interoperable GIS improves situational awareness and response efficiency, and can prevent further damage or loss of life. Responding agencies and emergency management personnel should have interoperable systems based on common baseline data layers. This foundation significantly contributes to the common operating picture and efficient information flow between responders and integrated command agencies.

Hydrological risks associated with river basins are made available through the NICS system, but the risk assessments in the country are not complete. The set of georeferenced data is extremely limited at this time.

Indicator 2.4.3: Standards for Georeferenced Data

Rationale given by the R2R diagnostic: Ensuring that data conform to a standard lowers overall operating costs for the GIS while ensuring the data quality is maintained. This enables faster processing and interpretation of the data and increases confidence in the models and outputs from the system. These efficiencies lead to more rapid and informed response operations with higher confidence in decisions.

The interviews showed that standards are not set, and institutional capacity and knowledge are said to be very limited.

Indicator 2.4.4: Standardized and Periodic Process for Updating

Rationale given by the R2R diagnostic: GIS data must be current and reliable to have value for emergency management activities. A system that regularly updates the information ensures that the information is always useful. It also improves situational awareness for focusing preparedness activities by increasing understanding and transparency about how hazardous areas, community vulnerability, etc., are established.

This NICS system defines the standard for georeferenced data, but there is no program in place to systematically feed the system with new and updated information. There is limited capacity for updating the system, and updates are mostly related to project activities.

Component ③ Facilities

Criterion 3.1: Emergency Operations Centers

Indicator 3.1.1: Available Emergency Operations Centers

Rationale given by the R2R diagnostic: An emergency operations center must be supported by sufficient backup systems, including power, heating and cooling, communications, staff, and operational resources (such as security, break rooms, planning/meeting rooms, media center, etc.). Ideally, an EOC would have a backup facility that is geographically diverse, and fully capable of operation in the event the primary EOC is not available.

During the assessment field work, two EOCs were visited. Both facilities are adequately equipped, and continuation of operations appears to be sufficiently guaranteed. The centers are not staffed 24/7 unless an incident or disaster has occurred. Both locations offer (improvised) facilities to house personnel for multiple days. The operational budget for the facilities is minimal. In the absence of a DMIS, the facilities lack access to sufficient statistical data to support detailed decision-making, especially during early recovery..

Indicator 3.1.2: Mobile Command Post

Rationale given by the R2R diagnostic: Mobile command post facilities typically include space for incident management activities in a controlled environment (secure, sheltered, etc.). The ability to accurately communicate site conditions, resource needs, and other information to the EOC is necessary. This requires reliable backup communication capabilities and the ability to operate in a self-supporting mode for some period, ideally 36 to 72 hours, without resupply.

Mobile command centers are absent in Bosnia and Herzegovina. Three vehicles donated by Japan are used as improvised on-site operational command centers.

Indicator 3.1.3: Clear Lines of Authority

Rationale given by the R2R diagnostic: Policy and authority must be clear for activation of the EOC and for the required staffing, fiscal authority, and operational responsibilities, including the role of elected officials, government staff, NGOs, and other supporting entities. How the EOC will function in relation to other governments (federal, territorial, municipal) and potential foreign disaster agencies or corporations should be spelled out in advance of an emergency.

The Operations Communication Center (OCC)-112 is established within the **Ministry of Security of Bosnia and Herzegovina**. Its main role is to improve coordination within the protection and rescue system from the moment when information about the event is received until the disaster response activities are completed. The center is particularly important in the event of natural or other disasters. The functions and activities of the OCC- 112 are regulated by the Rule Book on Organizations, Conditions, and Mode of Operations of the OCC-112. According to the Rule Book, the OCC-112 acts as an information and communication center and collects, processes, and distributes data on all types of threats from natural disasters or accidents on the territory of Bosnia and Herzegovina. Data are shared with competent institutions and bodies of Bosnia and Herzegovina, entities, Brčko District, neighboring countries, and international organizations. The center is not yet fully staffed and in particular lacks sufficient IT human resources.

Article 159 of the Law on Protection and Rescue in **Federation of Bosnia and Herzegovina** establishes civil protection centers-112. The article cites the need to collect data on all phenomena and threats that can lead to disaster and on consequences of disaster for people and material goods. It also cites the need to process and distribute such data to responsible authorities and legal entities, and transfer orders from the civil protection headquarters at the time of their operation. A network of emergency operational centers is to be established comprising: One at the national level at the ministry of Security. This center is already in existence but will not serve as a 112 call center. One operational

center at the Federation of Bosnia and Herzegovina, as well as in all 10 cantons. One on the entity level of Srpska and 5 on the regional civil protection office level, and one in the Brčko District. A total network of 19 EOCs.

Pursuant to Paragraph 2, Article 151, of the law, municipal civil protection operations centers work a minimum of eight hours a day in ordinary circumstances. During a natural or other disaster, centers work 24 hours a day. Decisions about the number of working hours during ordinary circumstances depend on several factors, including the municipality's risk profile, size, and population. The decision is made by the municipal mayor based on the proposal of the municipal civil protection service.

In theory the legislative framework is in place, but as mentioned in the discussion of Component 1, in practice it is unclear who leads the response. Definitions in the different laws differ, and the state of emergency can be declared at different levels, leading to conflicting responsibilities.

Indicator 3.1.4: Standardized Process for Social Media and Crowdsourced Data

Rationale given by the R2R diagnostic: To control the messaging surrounding an incident, it is necessary to know what is being said on social and conventional media and to respond to rumors and incorrect information with an authoritative voice and clear messaging. Collecting, aggregating, and analyzing media can help to identify needs for messaging, and can be valuable tools for analyzing the effectiveness of messaging and overall response.

Bosnia and Herzegovina has no system or procedure in place to monitor social media or crowdsourced data. The country does have communication team members within the EOC who interact with the media.

Criterion 3.2: Training Centers

Indicator 3.2.1: Capacity of Training Centers

Rationale given by the R2R diagnostic: A training center will have limited effectiveness unless it has the capacity to meet the needs of the targeted trainees. Dedicated resources for training will meet both general and specific needs of the training audience.

Apart from classrooms for theoretical training and improvised grounds where drills can be held, training facilities are absent in Bosnia and Herzegovina. First responders occasionally travel abroad (e.g., to Croatia, Serbia, or Turkey) to participate in international trainings. Multiple response organizations mentioned that training facilities are of the highest priority to systematically maintain an adequate level of readiness.

Indicator 3.2.2: Options for Multi-agency Training

Rationale given by the R2R diagnostic: Multi-agency training centers will allow interagency training and will also reduce costs by avoiding the need for training centers for specific disciplines. Beyond responders, the public and volunteers should have access to training centers to promote a bottom-up approach to emergency preparedness and response.

The indicator is not applicable since training centers are absent..

Indicator 3.2.3: Utilization and Maintenance of Existing Training Centers

Rationale given by the R2R diagnostic: A strategic plan and operational budget for use of a training site will ensure site optimization; engagement with multiple responder agencies and the private sector should be explored and formalized. Training centers can function effectively as secondary EOCs or regional command posts, if properly designed. The facilities must be maintained to a high standard and equipment kept current with the equipment being used in daily operations by rescue and response services.

The indicator is not applicable since training centers are absent.

Indicator 3.2.4: Geography and Location of Training Sites

Rationale given by the R2R diagnostic: Geography and accessibility are key to training the maximum number of agency personnel and public volunteers. Exploring partnerships with academic institutions and ensuring proximity and easy access to transportation will improve usage patterns for training centers, in turn increasing the opportunity for collaborative learning and establishing a culture of preparedness across public, private, nongovernmental, and academic sectors.

The indicator is not applicable since training centers are absent.

Criterion 3.3: Logistics Warehouses and Response Stations

Indicator 3.3.1: Entities and Frameworks for Logistic Hubs and Warehouses

Rationale given by the R2R diagnostic: Logistics management is often a complex process even during ordinary (non-disaster) periods. Due to this complexity, suitable and sustainable networks should be developed and maintained as part of a disaster preparedness plan. Logistics hub networks, including warehousing storage facilities, should be able to work with the private sector, government, and NGOs to successfully coordinate incoming international aid and distribute it to domestic areas in need.

The national-level civil protection system is by law responsible for coordinating international support. There is no inventory of possible locations—e.g., former military facilities—that could serve as logistical hubs. Logistical hubs are improvised at regular logistical hot spots throughout the country. Warehouses are managed by the Federation of Red Cross and Red Crescent Societies.

Indicator 3.3.2: Capacities of Logistic Warehouses

Rationale given by the R2R diagnostic: Beyond having a network of logistic hubs for distribution of goods and materials, operations management and the physical structure of logistic warehouses are key to increased resiliency during disasters. Warehouses must have the size, staffing, budget, and equipment to successfully intake, sort, maintain, store, and eventually distribute both perishable and nonperishable items and other equipment.

The Federation of Red Cross and Red Crescent Societies has warehouse capacity to cater to 15,000 persons with food and non-food items for a maximum of one month, after which the organization relies on international support. The responsible agencies in Bosnia and Herzegovina have no warehouse capacities.

Indicator 3.3.3: Capacities, Resources, and Abilities of Local Response Stations

Rationale given by the R2R diagnostic: Local response services are a critical resource during disaster and will be some of the first responders deployed. While local response stations are primarily for daily emergencies, a regional network of response stations will also provide a resource for disasters until more specialized aid is deployed. Daily emergencies will not cease during disasters, and ensuring that local response stations can continue to carry out their regular duties is key to building a resilient population. Local response stations include resources such as ambulance or paramedics, firefighters, police, and search and rescue.

A comprehensive overview of response stations and how these are staffed and equipped was not available during the assessment. Response times are not known to government institutions but are said not to meet European standards.

Indicator 3.3.4: Specialized Hazard Response Stations Criteria

Rationale given by the R2R diagnostic: Hazard-specific response stations may be housed or designated in the same structure as local response stations with dual-trained personnel. However, specialized equipment may be needed to respond to specific disasters or hazards that are typically beyond the capacity of local response stations. Hazard response stations may also be centralized as response situations are less common, but their equipment and trained personnel should reflect local threats and hazards. Local response stations do not typically respond to disasters for prolonged periods, so specialized teams are required.

Municipalities are responsible for the response station in their area. Some cantons have joint professional firefighting units for all or some of the municipalities. Nearly all (95 percent) of funding for municipal firefighting stations comes from the canton budgets, of which 10 percent is assigned to the established voluntary fire units in volunteer fire companies at the cantonal level.

Criterion 3.4: Shelter and Open Spaces

Indicator 3.4.1: Infrastructure for Emergency Housing and Temporary Shelter

Rationale given by the R2R diagnostic: Temporary shelters and emergency housing are potentially expensive. Preexisting partnerships to use land and provide shelter help defer or lower costs while reducing response time. Temporary housing is not meant to be permanent but should provide the basics of sustainable living, including protection from the elements, security, and a space for mental well-being. Organizing shelter resources during a disaster (rather than before) is not pragmatic and not likely to provide suitable protection to a displaced population.

There is no infrastructure in place for the sheltering of displaced persons. Housing is improvised on an ad hoc basis in (former) military barracks or in public facilities like schools. use during winter. Temporary sheltering is mostly improvised, and most displaced persons are supported by relatives.

Indicator 3.4.2: Designated Open Space for Disaster and Management Operations

Rationale given by the R2R diagnostic: Open spaces such as parks, vacant land, and green spaces are a natural convergence point for displaced people. They also may be relatively free of structures or debris after a disaster and hence be suitable locations for disaster-specific operations, such as mobile command posts and resource staging areas. Pre-disaster identification and planned use of open spaces will help save time and manage resource deployment during a disaster.

During a declared state of emergency, the authorities can use any parcel of land for the interest of the general population and to maintain public order. Open spaces are not designated for the specific use of disaster management operations.

Indicator 3.4.3: Disaster Evacuation Routes

Rationale given by the R2R diagnostic: Designated and safe disaster routes are key for saving lives and evacuating portable economic resources (such as livestock) before or during a disaster. The local population must also know when, where, and how to access evacuation routes through outreach and education.

Bosnia and Herzegovina has no predefined evacuation routes established, as only limited risk maps are available.

Indicator 3.4.4: Safe, Healthy, and Secure Locations for Temporary Shelter

Rationale given by the R2R diagnostic: While displaced persons may end up in emergency housing for years, the situation should always be viewed as temporary. In the short term, shelter communities often create added risks through overcrowding, crime, poor sanitation, and the absence of services that are well established in permanent communities. The longer the residence in temporary communities, the greater the risk for residents. A realistic timeline for transition to permanent housing should exist; this will also help speed the transition from response to recovery.

Temporary shelter is improvised, and therefore safety and health conditions can be variable. The capacity to secure drinking water after the 2014 flooding was sufficient, but the supply suffered initially from the pollution of the river. The Federation of Red Cross and Red Crescent Society has limited hygienic facilities, and the armed forces can mobilize some of its resources. Improvement of temporary shelter facilities was identified by interviewees as a priority.

Component 4 Equipment

Criterion 4.1: Emergency Social Services

Indicator 4.1.1: Medical Responders, Prehospital Health Care, and Medical Transportation Resources for Casualty Care

Rationale given by the R2R diagnostic: Emergency medical care is required during disasters and emergencies. Systems need to be maintained to ensure communication and the tracking and documentation of injuries and patients transported from the field to the hospital (from admittance to discharge). Appropriately equipped responders with medical training or environment-specific first aid skills are the ideal personnel for transporting patients to higher-level medical facilities or hospitals.

The diagnostic confirms that basic emergency social services are in place, including hospitals at regional and local level. However, the system is decentralized at the entity level, and capacities differ between regions. There are no public health institutes at national level: Brčko District has one hospital; the Federation has three clinical centers and Republika Srpska has two. In addition, there are private clinics, and in general there is an adequate number of hospital beds. Capacities are challenged by the insufficient number of health professionals and the need for new equipment, including protective equipment. In Brčko, hospital care is limited due to a lack of diagnostic systems. The COVID-19 outbreak required mobilization of capacities above cantonal level and revealed the degree to which the country depends on international support.

Ambulances and other medical vehicles for evacuation and transportation of casualties are largely available, except in Brčko. Based on SOPs signed between the armed forces and the Ministry of Security in line with the Law on Protection and Rescue and the Law on Defense, the armed forces can provide military medical units and helicopters (two are currently in operation) on a 24/7 basis for medevac purposes. Progress has been made to strengthen helicopter emergency medical services, but the country is still far from meeting international standards. Legislation is incomplete, and a specific development strategy is not in place (Kaplan and Dautovic 2019). Republika Srpska has its own helicopters.

The diagnostic found that standardized disaster and environment-specific first aid training is provided. The Federation of Red Cross and Red Crescent Societies offers standard training for first aid and has corresponding teams in place. A medical documentation system exists, together with a standardized triage system to identify priority patients. International Health Regulations are said to be followed.

However, a shortcoming in terms of field hospitals was identified. No rule book or SOPs are in place to establish field hospitals. As a result, they are improvised. The armed forces have tent emergency capacities that they can make available for humanitarian assistance.

Indicator 4.1.2: Disease Prevention and Core Services

Rationale given by the R2R diagnostic: A breakdown in public health and WASH (water, sanitation, and hygiene) after disaster and large-scale local emergencies is the largest contributor to disease outbreak. Countries or regions that have underdeveloped public health and WASH services may already have unchecked diseases; in more developed countries, diseases may present themselves only after a disaster or large-scale emergency. A country with adequate WASH resources during non-disaster periods will recover far quicker after a disaster.

The COVID-19 outbreak allowed assessment of disease prevention and core capacities. The diagnostic confirmed that WASH services for emergency deployment were adequate to prevent a breakdown in services. In addition, small-scale electrical supply and a surveillance system are in place. However, shortcomings were identified in emergency outbreak surveillance and public awareness materials. Stakeholders raised concerns about existing quarantine capacities and the possibility of scaling up. An action plan for pandemics was said to be missing, and the crisis was

expected to call attention to deficiencies in professional communications between health entities and the lack of appropriate and consistent legislation. In this legal vacuum, it was assumed that the sector of Health within the ministry of Civil Affairs would coordinate.

Indicator 4.1.3: Social Services Programs

Rationale given by the R2R diagnostic: Vulnerable populations, including groups like women and children who are often targets of violence, are the populations most devastated by a disaster. Certain populations, such as the elderly and those with ongoing mental illness, may not have the ability to take care of themselves. Post-disaster contexts can create conditions that may lead to extremes in cultural influences that could either exploit or traumatize specific vulnerable populations.

During the 2014 floods, the absence of a welfare safety net increased the income differences within the population in the affected areas, with negative consequences for women and children in particular. However, affected municipalities did assist vulnerable groups to varying degrees (EU et al. 2014).

The Federation Ministry of Labor and Social Policy, the Republika Srpska Ministry of Health and Social Welfare, other relevant social welfare institutions, and UNICEF cooperated to draft a manual on enhancing and protecting social welfare and child welfare, with a special focus on strengthening the resistance of local communities and creating better preparedness for response to natural and other disasters. The manual pays particular attention to continuous strengthening of Social Work Centers' capacities, considering that these centers play a crucial role in protecting the most vulnerable populations, especially children (Government of Bosnia and Herzegovina 2015). Key informant interviews confirmed that specific vulnerable groups, like patients with mental health conditions, received special attention during the response phase of recent disasters.

In practice, assistance to groups with specific needs is secured through agreements with civil society. The Federation of Red Cross and Red Crescent Societies includes specific activities for vulnerable populations within its regular activities and receives international support (including from the Swiss Red Cross and Red Crescent Society) to prepare vulnerable communities for disasters. It also operates two vehicles that are used in registration of houses of specific vulnerable groups. Other international (UN) organizations are also active in country to cater to the needs of vulnerable persons.

The presence of migrants in parts of the country requires particular types of social services. International actors like the International Organization for Migration and United Nations High Commissioner for Refugees are active together with the Federation of Red Cross and Red Crescent Societies to provide food and shelter to the migrants. These programs are internationally funded. Contingency plans for migrants during the COVID-19 pandemic are drafted in close cooperation with international actors. Social service programs could be improved by greater awareness of special needs, in-depth assessments, and support to local authorities.

Indicator 4.1.4: Management of Mortality During Emergencies

Rationale given by the R2R diagnostic: Deceased bodies hold minimal physical risk of disease transmission for survivors and responders, but they can attract vector and zoological factors that can cause disease separately. Failure to manage local cultural needs for disposal of bodies will slow disaster recovery. Body identification is important if resources permit, as this may give family members their only opportunity for closure.

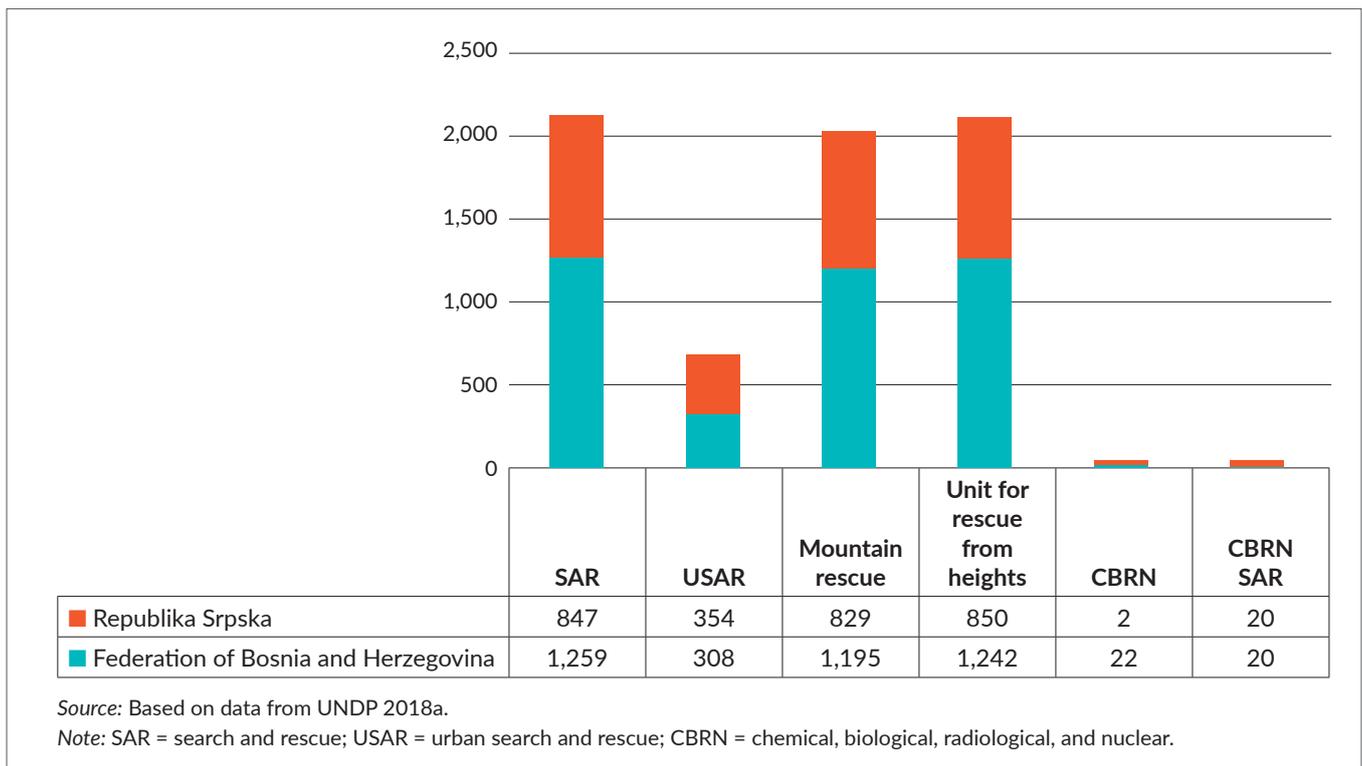
Protocols for storage or temporary burial of deceased persons during mass fatality events have been established. There is also a specialized approach for identification of recovered bodies during mass fatality events that is implemented consistently across the jurisdiction. Although guidelines regarding how to respect cultural and religious beliefs seem to be absent, safety procedures for recovery, handling, storage, and burial/cremation (or other) of bodies are available. In Brčko, standard mortality equipment and resources are available.

Criterion 4.2: Information and Communications Technology

Indicator 4.2.1: Availability of Radio Communications in Support of Emergency Operations

Rationale given by the R2R diagnostic: Reliable radio communication forms a crucial lifeline for responders and provides critical information for EOC and command post personnel. Older and unreliable systems compromise safety and operations when they are needed the most. Newer digital systems enhance reliability and provide secure (encrypted) communications, often with text and other advanced capabilities to better manage all communications.

Figure 8 Ultra-shortwave Radio Devices Needed in Bosnia and Herzegovina



Shortwave and ultra-shortwave systems are in place. However, the R2R diagnostic identified shortcomings in the availability of radio communication in support of emergency operations (see figure 7 for details on the need for ultra-shortwave devices). In particular, small communities were not able to procure these systems, and parts of the country are currently not covered. Mobile transmitters for redundancy purposes are available, but these are not sufficient to cover the entire jurisdiction. A study designed to strengthen coverage is ongoing. The UNDP (2018) roadmap for Bosnia and Herzegovina lists the exact needs for ultra-shortwave radio devices for the Brčko District, the Federation of Bosnia and Herzegovina, the cantons and the units of local self-government in the Federation of Bosnia and Herzegovina, and the units of local self-government and the entity level in Republika Srpska.

Indicator 4.2.2: Interoperability of Radio Communications in Support of Emergency Operations

Rationale given by the R2R diagnostic: Interoperable radio systems improve situational awareness and response efficiency and can prevent further damage or loss of life. Radio systems for responding agencies should be capable of communicating together in order to allow for a unified response and to ensure efficient information flow between responders, the command post, and EOC as necessary.

The overall conditions for interoperability, such as ad hoc systems, protocols, and agreements, are in place. Radio checks are regularly performed. Links between systems exist, and normal exchange between different parts of the country takes place. However, the interoperability of radio systems suffers from the existing differences between sets of radio equipment, which were donated by different institutions at different times. Civil protection personnel and firefighters work with digital radio, which is not necessarily interoperable with the systems of the police.

Indicator 4.2.3: Broadband Network Connectivity for EOC Use

Rationale given by the R2R diagnostic: Broadband network connectivity, including connection to the internet, allows for efficient communication between response and relief agencies, incident command posts, and the Emergency Operations Center. This allows voice, data, and video communication that improves situational awareness, provides crucial links to the world outside of the disaster-affected area, and supports use of GIS, incident management systems, and early warning systems technologies.

Broadband network connectivity is available to the EOC, and the coverage across the country up to 4G is generally good, though the maximum speed varies. Broadband services enable voice and video communications and are available for multiple incident command post use. The connections are regularly tested and maintained. A digital SDH network and radio network are in place, but there is a need for more digital transmitting. Additional repeaters could make it easier to share digital data.

Indicator 4.2.4: Protection and Rapid Recovery of Public and Private Sector Communication

Rationale given by the R2R diagnostic: The public relies upon communications during and following a disaster event. Hence a program for communication infrastructure protection and recovery must include participation of industry partners and all levels of government. Such participation could require a legislated mandate that ensures cooperation by all parties and provides some level of protection to private business information.

The capacity to restore public and private communication structures exists, and in general relies on the spare parts available through commercial telecom providers. However, in Brčko, no plan exists for restoring communication infrastructure quickly. During recent disasters, a network of highly active radio amateurs in the country played an important role in protecting and restoring communication services. The Ministry of Defense has additional radio capacity that can be deployed on request of the civil protection system. One shortcoming is the private sector's lack of involvement in preparing for and securing rapid recovery.

Criterion 4.3: Hazard-Specific Response Capacity

Indicator 4.3.1: Functional Wildland Firefighting Capabilities

Rationale given by the R2R diagnostic: Many jurisdictions, including some heavily urbanized areas, include wildland areas. A functional capacity to prepare for and suppress wildland fires ensures wildland fires are less likely to breach the interface between wildland and built-up areas or communities, causing loss of life and severe economic consequences. As with flooding, wildland fires are often rapid-onset events with little opportunity for evacuation before peak event intensity.

The R2R diagnostic confirmed that most wildland firefighting capabilities were in place, including public initiatives to help prevent wildfires along with basic capabilities, equipment, and personnel to contain localized wildland fires. The Ministry of Defense can provide additional support through helicopters (though only two are currently operable) along with other equipment and technical resources. The EU has supported building wildfire capacities, but most equipment is old, and the financial resources to update it are limited. The UNDP (2018a) roadmap lists the following equipment needs for ground forest fire fighting: 1,100 firefighting suits and firefighting helmets, 75 command vehicles,

340 vehicles for extinguishing fires, 157 vehicles for the transportation of staff, 141 tankers, 1,865 ultra-shortwave radio devices, 334 power generators, and 173 rescue boats. In addition, the diagnostic noted the existence of forest fire video surveillance, but also the need for an advanced system including use of aircraft, satellite, ground mapping, and meteorological data.

Indicator 4.3.2: Capabilities for Rescue During Floods or Water-Based Emergencies

Rationale given by the R2R diagnostic: Water-based rescue is a core response capacity in areas where floods or other water risks are prevalent. Specialized training and equipment are mandatory for safety and risk mitigation in water environments. Water rescue is a separate category from coast guard or ocean-based rescue (or rescue from other large water bodies) and requires extremely rapid response deployment to be effective.

In the absence of a coastline, a coast guard is not relevant for the country. However, floods are frequent in Bosnia and Herzegovina. The R2R diagnostic confirms that in general the equipment for flood protection and rescue is acceptable. Units are equipped and trained, and some teams have high pumping capacity and are equipped with high-quality gear. Flood warning systems exist and are maintained along with trained responders, advanced equipment, and jurisdictional budget. However, flood rescue could be improved through outreach and education programs to train residents in flood-prone areas in simple water rescue techniques. The UNDP (2018a) roadmap notes the following deficits related to rescue during floods and water-based emergencies:

- The deficit totals for flood rescue by boats and diving units include, among others, 1,157 trained personnel, 137 rubber boats, 101 life boats, 262 outboard motors, 109 passenger vehicles, 108 vehicles for the transportation of staff, 198 vehicles for the transportation of equipment, and 289 trailers for the transportation of boats.
- The deficit totals for pumping water include, among others, 1,355 trained personnel, 106 high-capacity pumps, 265 medium-capacity pumps, 127 passenger vehicles, and 234 off-road vehicles.
- The deficit totals for flood containment include, among others, 1,380 trained personnel, 1,184 sandbag filling machines, 436 barriers (water-fillable, air-filled, and aluminum), and 235 power generators.

Indicator 4.3.3: Rescue Capacity for Structural Collapse and Entombed Rescue

Rationale given by the R2R diagnostic: Structural collapse is typified by the victims being buried or otherwise not accessible to the responders. This differs from entrapment, in which victims are physically held by or trapped inside an item but (at least partially) accessible to responders. These two types of rescue disciplines may be present at the same incident and indeed be present with the same victim. In such cases, the rescue is classified as an entombed rescue: the victims are buried and their entrapment is not initially discernable.

The capabilities of the country's urban search and rescue (USAR) team are between medium and heavy. Through an ongoing EU project, the team will be certified and aim to follow INSARAG (International Search and Rescue Advisory Group) guidelines. Some of the required equipment is lacking but the aim is to procure this as soon as possible. A water and below-water rescue team is in place. Thus the elements for rescue capacity are covered for structural collapse, including specialized training.

Medically trained rescue personnel exist for medical interventions. However, the ability to deploy the team is currently hampered by gaps in the available equipment and the absence of a systematic approach to budget, deployment strategies, and training schedules. The UNDP (2018a) roadmap summarizes the equipment needs for search and rescue as follows:

- The deficit totals for search and rescue include, among others, 1,798 trained personnel; around 2,000 protective suits, helmets, masks, gloves, boots, and shoes; around 130 command vehicles, 220 vehicles for the transportation of staff, 134 vehicles for the transportation of search dogs, and 208 off-road vehicles; 2,124 ultra-shortwave radio devices; and 374 search dogs.

- The deficit totals for urban search and rescue include, among others, 472 trained personnel; around 650 protective suits, helmets, masks, gloves, boots, and shoes; 36 command vehicles, 67 vehicles for the transportation of staff, 35 vehicles for the transportation of search dogs, and 63 off-road vehicles; 662 ultra-shortwave radio devices; and 105 search dogs.

Indicator 4.3.4: Functional Hazardous Mitigations Capability

Rationale given by the R2R diagnostic: Hazardous material incidents pose a serious risk to anyone who is not properly protected, including rescuers wearing firefighting equipment. The primary focus at such incidents is to prevent the situation from deteriorating and causing greater harm. Rescue may be secondary. Developing an ability to do more than secure the area and evacuate those at risk requires intense investment in equipment and training.

Chemical, biological, radiological, and nuclear (CBRN) teams are in place for the territory of Bosnia and Herzegovina and were said to be well equipped. This judgment is reflected in the UNDP (2018a) roadmap, which found the needs for CBRN teams much smaller than for other response teams:

- The deficit totals for CBRN detection and sampling include, among others, 36 trained personnel, 72 protective suits and sets for personal CBRN protection (insulated breathing devices and protective masks, spare air tanks for breathing devices), around 65 protective coveralls and helmets, 22 radiological detectors and gas detectors, and 12 kits for the detection of biological warfare agents, including chemical detectors and water tanks.
- Total deficits for CBRN search and rescue include, among others, 72 trained personnel and their required protective suits, protective coveralls, protective aprons, helmets, glasses, masks, gloves, boots, insulated breathing devices and protective masks, and spare air tanks for breathing devices; and eight transportable decontamination units, radiological detectors, gas detectors, kits for detecting biological warfare agents, chemical detectors, vehicles for the transportation of staff, and vehicles for the transportation of equipment and water tanks.

In addition, hospitals and medical resources would benefit from hazmat awareness and additional protective resources. A systematic approach to budget, deployment strategies, and training schedules would further strengthen the CBRN capacities.

Criterion 4.4: Urban Firefighting and Technical Rescue

Indicator 4.4.1: Functional Urban Firefighting Capabilities

Rationale given by the R2R diagnostic: Volunteer fire services are an option in rural or less populated areas. However, full-time services will tend to respond to a greater variety of incidents, as their training level increases with time, experience, and resources. Equipment and training are a major factor in any fire service's ability to respond. The fire service's tactics will necessarily reflect its equipment capabilities if responder safety has been fully considered.

Firefighting capacities in the jurisdiction meet the requirements of the R2R diagnostic: programs for fire prevention exist; a network of fire services is in place with the required equipment; fire services have the capacity to extinguish fires in high buildings; and budgets are available and regularly reviewed. In Brčko, where some equipment was recently donated by Germany, firefighting equipment was said to be good (up to par with EU rules) and vehicles above minimal standards. Budget for maintenance and replacement of equipment was adequate, and a fire protection plan of 2013 has been followed. Only a high ladder car was judged to be outdated and should be replaced. In Republika Srpska, teams were likewise found to be equipped and trained, benefiting from recent international support, including from the World Bank and the EU. The armed forces also possess fire rescue capacities, including fire extinguishers.

The findings of the diagnostic confirm observations from the UNDP (2018a) roadmap, which indicates that firefighting services have 22 units and 631 staff, along with vehicles, tanker trucks, rescue boats, and trailers; these are described as surplus capacity that could be restructured and benefit other response teams.

However, differences exist between municipalities, with smaller municipalities having less budget for maintenance and receiving older equipment from larger cities. Protective clothing and gear may not be at the same level everywhere, and there are concerns about compatibility of equipment throughout the country.

Indicator 4.4.2: Entrapment and Extrication Rescue Capabilities

Rationale given by the R2R diagnostic: Victim entrapment in a damaged motor vehicle is the most common technical rescue worldwide. Removing the vehicle from the victim, and not the victim from the vehicle, requires specialized equipment, training, and victim care. Such training and equipment may be the basis for responding to other emergency incidents in which a victim or a portion of a victim becomes trapped inside something (household items, farm equipment, commercial/industrial machines, etc.).

The capabilities for entrapment and extrication build on the capacities described under 4.4.1. Most elements under this indicator are in place, including rescue tools and personnel for vehicle extraction, protective personal equipment, medical and lifesaving resources, and adequate budget and training resources. Shortcomings exist in terms of heavy rescue squads or vehicles for advanced extrications (such as entrapment in industrial machines, farming equipment, and other machinery) and vehicle recoveries. Finally, procurement was mentioned as an issue, as procedures are long and bureaucratic, and in general funding is insufficient.

Indicator 4.4.3: Functional Rope Rescue Capabilities

Rationale given by the R2R diagnostic: Rope rescue is the basis for other technical rescue disciplines (confined space rescue, water rescue, trench rescue, etc.), which often require ropes, harnesses, anchor and haul devices, etc. to undertake safely. Providing safety regulations for workers will limit death and injury in a high-risk setting.

Rope rescue capabilities are partly covered by the Mountain Rescue Services, including rappelling and abseiling experience and capacity and equipment for low, steep, and high angle rescue, including in remote areas. However, budgets and regular training schedules for personnel could be improved. A peer review that included recommendations for mountain rescue was undertaken by the Directorate-General for Neighborhood and Enlargement Negotiations, but it was confidential in nature and could not be consulted for the R2R diagnostic. The UNDP(2018a) roadmap identified the following needs:

- The deficit totals for Mountain Rescue Services included, among others, 1,780 trained personnel; around 2,000 protective helmets, glasses, gloves, and boots; 370 passenger vehicles; 233 snowmobiles; and 218 off-road vehicles.
- A unit for rescue from heights would require additional 2,018 staff, 234 vehicles, and 2,117 ultra-shortwave radio devices.

Indicator 4.4.4: Functional Confined Space Rescue Capabilities

Rationale given by the R2R diagnostic: Confined space rescue is at the very high end of equipment and training requirements for technical rescue. Such rescues are resource- and trained personnel-intensive. Emergency services able to perform proper confined space rescues are well equipped and trained. This level of emergency service is thus expensive and considered at the apex of emergency response service delivery.

The scores for the functional confined space rescue capabilities are rather positive, even though such capacities are resource- and trained personnel-intensive. Legislation and workplace regulations exist for safe working practices in confined space. There is enough rope rescue equipment to enable rescuers and victims to be safely lifted, lowered, and transitioned laterally throughout the rescue as required, and confined space rescuers are available 24 hours a day. However, the R2R diagnostic identified the lack of atmospheric monitoring and ventilation equipment for confined space rescue and the very limited number of suitable communication devices for work in a potentially explosive environment. There was also room for improvement in terms of budget and regular training schedules.

Component ⑤ Personnel

Criterion 5.1: Incident Organization Structures

Indicator 5.1.1: Existing Policy for a Common Incident Organization Structure

Rationale given by the R2R diagnostic: Incident organization structures, such as the Incident Command System or the National Incident Management System in the United States, are more successful if the system is directed policy. Formal policy more strongly encourages response agencies to follow a common and standardized system. Without political backing on a common incident organization structure, all response entities will not have the benefits of a comprehensive, jurisdiction-wide, systematic approach to managing incidents. Ideally an incident organization structure is consistent with internationally best practice when forming system standards.

The Law on Protection and Rescue defines the responsibilities of actors, and upon activation of the Protection and Rescue Plan, the Operations Communication Center-112 coordinates the activities of the actors in country and manages information sharing. The operational responsibility for EP&R in Bosnia and Herzegovina rests with the entities and the Brčko District, resulting in the organization of EP&R services at three levels: municipal, cantonal, and federal. Decisions are made based on the subsidiarity principle. Actions are based on the Rule Book Rule Book on Organizations, Conditions, and Mode of Operations of the OCC-112.

However, differences exist. Formal decisions regulating the organization and functioning of response agencies are adopted by most local self-government units: 79.7 percent of units at Federation level, 50 percent at canton level, and 84.5 percent in Republika Srpska (UNDP 2018a). As a result, some local authorities are more advanced in defining emergency plans and predetermined agreements than others.

In addition, Republika Srpska has a more centralized system than other parts of the country. Coordination remains a challenge and is said to be misunderstood in the sense that entities feel undermined by a perceived top-down approach. The international community calls for strengthening of joint or harmonized procedures to coordinate staffing of operations and to agree on systems to manage and monitor available response assets. The UNDP (2018a, 17) roadmap also recommends better integration of respective resources to enhance capacities, rather than each municipality developing its own (smaller) response units.

Indicator 5.1.2: Flexible and Scalable Incident Organization Structure

Rationale given by the R2R diagnostic: A flexible and scalable response structure allows for emergency incident flexibility and promotes user familiarity through a common structure for multiple incident types. The system should apply to any incident regardless of cause, size, location, or complexity. This allows various organizations and agencies to work together in a predictable, coordinated manner.

Although the local administration oversees disaster response, it can ask the canton level for support when capacities are surpassed. In turn, the canton level can request support from the Federation, possibly leading to the declaration of a state of emergency.

As of 2008, almost 20 people were employed by the state-level sector for civil protection, although this number is expected to double following the issuing of the new Law on Protection and Rescue and the establishment of the Operation Center-112. The Federation of Bosnia and Herzegovina Civil Protection Headquarters is based on a staff of 20 public servants, while the 10 cantonal headquarters employ a total of 120 people. There are about 150 personnel employed at civil protection in the Republic of Srpska, of whom 45 are civil servants, 15 are temporary employees, and 90 are contracted to work in the mine clearance program. About 100 people are employed at municipal or town level. In Brčko District a total of around 300 people are involved in civil protection, mainly in professional operational units engaged in areas such as firefighting, decontamination work, clearance of mines and unexploded ordnance, and delivery of emergency medical and veterinary assistance (UNSDR and World Bank 2008, 47). These numbers are

somewhat older but are said not to have changed significantly over the years.

In the event of natural or other large-scale disasters, when civilian protection and rescue structures are not able to provide an adequate response, the Armed Forces of Bosnia and Herzegovina are engaged. The condition for their engagement is that the available resources of the civilian authorities are either exhausted or insufficient to respond to the natural or other disaster. Engagement of the armed forces under these circumstances is done in accordance with the Law on Defense of Bosnia and Herzegovina (Official Gazette No. 88/05), the Agreement on Cooperation between the Ministry of Defense of Bosnia and Herzegovina and the Ministry of Security of Bosnia and Herzegovina in the area of reaction to natural or other disasters, and the SOPs for the engagement of the Armed Forces of Bosnia and Herzegovina in providing assistance to the civilian authorities (UNISDR and World Bank 2008, 26).

The Federation of Red Cross and Red Crescent Societies is an important factor for scalability of response and is represented at all levels, from municipal to national. When an emergency is declared, the Red Cross and Red Crescent Societies becomes a formal part of the system and receives requests from the responsible authorities.

Indicator 5.1.3: Training and Implementation Resources

Rationale given by the R2R diagnostic: An incident organization structure consistent with internationally recommended practices should be supported by resources, including reference materials, training materials, and exercise scenarios that provide responders the opportunity to practice in a consequence-free environment. These reference and training resources should be provided to emergency responders as well as coordinators who may be working in emergency operations centers.

Even though standard operating procedures exist to support the incident organization structure, including through the establishment of multiple rule books, there is room for improvement to support the responders with training materials and checklists. Knowledge management appears to be an issue for disaster preparedness, and the UNDP (2018a, 17) roadmap recommends that all stakeholders adopt the latest methodologies and know-how on risk assessment and learn more about the capacities of the other bodies involved in EP&R. In fact, the roadmap recommends regular capacity assessments to evaluate existing assets, pick up on deficiencies, and design appropriate measures.

Deficiencies in interoperability exist. Although each administrative level has its own IT assets and systems, and these are compatible with each other, an agreement on data sharing should be formalized (UNDP 2018a, 19). A common app and software for assessment is needed but is challenged by the political setup of the country.

Indicator 5.1.4: Roster of Trained Personnel and Database of Common Response Resources

Rationale given by the R2R diagnostic: Emergency response agencies are trained and equipped to manage a threshold for both number of simultaneous events and event complexity/intensity. When these thresholds are exceeded, the responsible agency must have access to additional resources to effectively manage the emergency. Sharing of personnel and resources through a formal process can ensure collective preparedness of response agencies, help manage cost, and improve response efficiency. This personnel and resource sharing begins with shared understanding of what supports may be available to responding agencies when they are needed most.

Human resources are a significant challenge, and the capacities at local level are low. In a municipality of 15,000–20,000, only three persons deal with civil protection; in municipalities of 5,000–10,000, only one person does. The UNDP (2018a) roadmap indicates deficits in personnel for response components totaling 13,546 individual staff. Table 2 illustrates the personnel deficits per response unit.

Table 2 Deficits in Personnel for Response Units

| | SAR | USAR | Mountain rescue | Rescue from heights | CBRN | CBRN SAR | Ground forest fire fighting | Flood rescue | Water pumping | Flood containment | Excavators |
|--------------------------------------|-------|------|-----------------|---------------------|------|----------|-----------------------------|--------------|---------------|-------------------|------------|
| Federation of Bosnia and Herzegovina | 1,024 | 270 | 971 | 1,191 | 36 | 36 | 806 | 877 | 890 | 901 | 635 |
| Republika Srpska | 756 | 202 | 801 | 809 | 0 | 36 | 289 | 268 | 463 | 477 | 286 |

Source: Based on data from UNDP 2018a.

Note: SAR = search and rescue; USAR = urban search and rescue; CBRN = chemical, biological, radiological, and nuclear.

However, surplus capacity in terms of staff resources exists in units dedicated to firefighting (631 staff), rescue from ruins (349 staff), and hazard rescue (169 staff). These resources could be better utilized through restructuring of units and personnel. The absence of an integrated approach is equally visible in the absence of the specialized mixed protection and rescue unit called for in Article 13 of the framework law. This unit would be made up of specialized civil protection units and services of the entities, the Brčko District, and other institutions, bodies, and legal persons on the level of Bosnia and Herzegovina, which would act in case of natural or other disaster and participate in international exercises, relief operations, and other activities.

Multiple databases are in place for various purposes but lack integration. The main challenge is that records are kept at local level, and instructions and procedures to regulate the inputs and data sharing have not been established.

Criterion 5.2: Training and Knowledge Building

Indicator 5.2.1: Training program in place

Rationale given by the R2R diagnostic: Those within an organization who may be involved in planning for and responding to an emergency should be appropriately prepared. They require a clear understanding of roles and responsibilities and how they fit into the wider emergency preparedness and response system. Training builds capability and capacity for emergency response incidents. Training should also extend beyond those employed by the jurisdiction and include contractors and the staff of voluntary organizations who might support emergency planning or response.

The R2R diagnostic found that the EP&R capacities of Bosnia and Herzegovina for training are lacking, and that there are concrete needs for the development of personnel, in particular local first responders. Training programs are currently delivered by international organizations; though these are widely appreciated and needed, a systematic training program is not in place. In 2014, it was noted that a training framework and training plan were being developed, but four years later the UNDP (2018a) roadmap noted that 74.7 percent of units of local self-government in the Federation had protection and rescue development programs in place, and merely 41.4 percent of units in Republika Srpska. The roadmap recommended standardized, consistent, and cyclical capacity-building and training processes for these and other units and services, including establishment of training centers.

The absence of adequate training facilities has made operational training challenging, and development of a comprehensive training program is hampered by the fragmentation of training initiatives taking place. There are differences in training practices across the country and gaps in training programs, including in technical dimensions and in training for primary emergency response agencies and for nontraditional emergency roles. In addition, there is no joint training of emergency medical technicians and no consistency in involving other EP&R actors. The Federation of Red Cross and Red Crescent Societies organizes trainings for its volunteers, but does not have its own training facilities.

It is accepted that training should be in accordance with the Union Civil Protection Mechanism (UCPM) standards to offer an equal level of knowledge and to enhance interoperability. Given the country's intention of joining the UCPM, developments are ongoing to implement trainings and strengthen coordination in this regard.

Indicator 5.2.2: Availability of Qualified Trainers and Appropriate Training Materials

Rationale given by the R2R diagnostic: A robust training program offers multiple methods of training, including off-site, on-site, instructor-led classroom training, self-directed, hands-on study, etc. While online training for basic concepts may be easy to deliver for those whose primary role is not emergency preparedness or response, in-person training coupled with workshop activities is more meaningful for participants and more easily absorbed. Having a variety of training methods is important to ensure comprehensive understanding of the material.

Previous and current trainings from international actors, including the EU and UNDP, are qualitatively good: they are based on experience, best practices, and international standards, and follow adult learning methodologies. Still, this indicator is challenged by two main issues, namely the absence of training centers in country and the dependency on trainers from outside the country. Efforts are needed to ensure that the training program becomes robust, focused on country needs, and sustainable. A train-the-trainers approach would ensure knowledge dissemination within the country but is not currently in place. The UNDP (2018a) roadmap recommends that capacity-building strategies build on lessons learned from previous disasters and on evaluations of changes in the overall preparedness systems. In connection with the wish to join the UCPM, it is crucial to provide the EP&R system with internationally certified trainers.

Indicator 5.2.3: Formal Assessment Program

Rationale given by the R2R diagnostic: Regular program evaluation is critical to ensuring a comprehensive and effective training program. Feedback should be obtained from all participants to determine training and instructor effectiveness as well as knowledge or skill acquisition. Analyzing this feedback can identify weaknesses in the training program and aid in closing critical learning gaps that may otherwise compromise effective emergency response operations.

Building on the assessment of the previous indicators, the diagnostic identified the importance of strengthening formal assessment of trainings. Following practices of international organizations delivering trainings in country, training materials and instructor techniques are currently evaluated based on international best practices and adult learning standards. However, the trainings are isolated events and not part of an overall and long-term development program, where personnel behaviors and capability improvement are evaluated, and where response outcomes are monitored through exercises and real emergency events.

Indicator 5.2.4: Planning and Tracking of Personnel Development

Rationale given by the R2R diagnostic: When responder agencies formally and deliberately plan personnel development and track its results, agency-specific capacity can be known. This information provides agencies with heightened awareness and advanced knowledge of when additional resources or special emphasis may be required to ensure they have the capacity to continually meet their responsibilities.

In line with the previous findings, tracking of personnel deployment is not sufficiently done. Even when personnel of federal authorities are sent abroad to obtain certificates from international training courses, this training does not form part of a development plan and is not linked to other training. Participation in basic courses is mandatory for agencies, but these experiences remain isolated training events instead of being part of clear career development.

Criterion 5.3: Exercises and Drill

Indicator 5.3.1: Comprehensive Exercise Program

Rationale given by the R2R diagnostic: A formal and functional exercise and drill program enables testing of response plans and application of training in a consequence-free environment. Exercises allow for team building within and among responder agencies, especially when exercises and drills are collaboratively designed and delivered. Exercises should reflect appropriate jurisdictional risks and increase in complexity and difficulty as participants and their agencies increase their operational response capacity.

The R2R diagnostic noted the organization of multiple exercises, often in cooperation with international actors. For example, NATO supported full-scale exercises with different scenarios. The USAR team is equipped and trained as part of UCPM projects. Last year the Federal Water Management Agency–Sava River organized exercises to check its preparedness level and learned that it has insufficient human resources in the civil protection structure. Three large-scale field exercises and tabletop exercises have been organized since 2010 to check preparedness. In 2010 an exercise took place simulating a chemical attack at a Tuzla airport, requiring decontamination. In 2020, an exercise is planned in Banja Luka. Working together with civil protection experts, firefighters, and emergency medical teams, the Federation of Red Cross and Red Crescent Societies annually organizes a major exercise of a certain type of crisis at Federation, municipal, or canton level.

This indicator thus scores positively, given exercises building on proper legislation and guided by identified hazards, sharing of lessons learned, and existing budgets.

Indicator 5.3.2: Collaboration and Coordination

Rationale given by the R2R diagnostic: Collaborative and centrally coordinated exercises that involve multiple response agencies provide opportunities for collective learning that could otherwise be realized only during actual emergencies and disasters. Such exercises, while somewhat more complex, are also more reflective of real-world response operations, which tend to involve a variety of sectors and agencies.

As seen in the previous indicator, exercises involve multiple actors, are often organized in coordination with other response agencies, and often involve volunteers. However, further coordination and cooperation between the different administrative levels should take place, given that coordination is a weak element of the incident organization structure. The diagnostic found that although the Federation of Red Cross and Red Crescent Societies has professional training and exercise programs in place and plays a key role in the overall EP&R system, its involvement at entity level is not obligatory and results from ad hoc decisions.

Indicator 5.3.3: Exercises Designed to Validate Response Plans

Rationale given by the R2R diagnostic: Evaluation is the key to a successful exercise. It is where all lessons learned and gaps are identified. An essential part of a successful evaluation process is ensuring objectives are developed based on plans and assessed jurisdictional risks. Clear and concise objectives are key factors that form evaluation criteria and performance measures. A post-exercise report on how to implement changes needs to be carefully documented, tracked, and used during annual work planning for following fiscal years.

The exercise program is weakened by the absence of objectives that are developed based on plans and assessed jurisdictional risks. The results of exercise simulations are not necessarily linked with political decision-making but focus instead on technical competencies. There is a missed opportunity to use exercises and drills to validate response plans and to identify improvements for the system. The UNDP (2018a, 31) roadmap recommends that stakeholders “engage on an ongoing basis in formulating plans in a coordinated manner, undertaking activities to ensure that plans can actually be carried out in a coordinated manner,” and that they “regularly test and exercise plans in order to identify gaps and areas for improvement, identify resource needs and store and distribute resources where needed.”

Indicator 5.3.4: Robust Exercise and Drill Planning Process

Rationale given by the R2R diagnostic: Exercises can be difficult and time-consuming to develop. Personnel with multiple other duties may not prioritize development of complex field exercise with multiple stakeholders. Significant time and money must be dedicated to develop a robust and useful program. In many cases, large-scale operational exercises have been successful only with year-long planning, a dedicated budget, and experienced exercise planners. Smaller budgets are acceptable as long as the scale of the exercise equals that of the budget. For example, a multi-day, multi-stakeholder, 24/7 exercise would be challenging without the support of a dedicated design and delivery team.

Exercises and drills meet this indicator in part. They are planned by experts, have key design components such as objectives, and build on realistic scenarios. They are also supported by senior management. However, there is room for improvement through meticulous planning of the budget and development of exercises well in advance.

Criterion 5.4: International Support Coordination

Indicator 5.4.1: Agency Assigned to Coordinate International Support

Rationale given by the R2R diagnostic: Designating an agency to officially request disaster relief formalizes and streamlines the assistance request process and improves the speed and efficiency of international aid delivery following widespread and/or intensive emergencies and disasters. Improved capability enables the jurisdiction to make the best use of internationally accepted tools and resources. With this capacity, the jurisdiction can complete advanced planning to identify likely disasters and potential aid requirements. It is also better able to coordinate with international and humanitarian aid agencies as well as other levels of government.

The Ministry of Security coordinates international assistance and is responsible for interdepartmental coordination of international assistance, regardless whether or not the state of emergency has been declared, or the coordination body activated. A coordination body can be activated to coordinate distribution of international assistance following a natural or other disaster. When the scope and intensity of an event affects only one entity or Brčko District, the On Site Operations Coordination Centre (OSOCC) staff can be placed in the Operations Communication Center-112 to distribute the limited capacities according to the needs.

The Ministry of Security of Bosnia and Herzegovina cooperates with competent institutions and bodies of the EU, UN, NATO, and other international institutions and organizations. In addition, the country has bilateral agreements relevant to EP&R with Serbia, Croatia, Montenegro, North Macedonia, and Slovenia; and has signed memorandums of understanding with the Russian Federation, Albania, Turkey, and Italy. Political leaders and their advisors should be better trained in how to request international assistance.

For interdepartmental coordination on the occasion of receiving, sending, or transiting out of international assistance for protection, there is a protocol on cooperation and identification of contact points for cooperation with the Civil Protection Mechanism of the EU. This protocol foresees a cooperation mechanism with representation from the Ministry of Security of Bosnia and Herzegovina, Ministry of Interior of the Republika Srpska, Civil Protection Department of the Federation of Bosnia and Herzegovina, and Public Safety Department of Brčko District (UNDP 2016, 34).

Indicator 5.4.2: Minimum Standard for Provision of Aid by International Groups

Rationale given by the R2R diagnostic: The accountable agency for coordinating international support should be aware of international standards that ensure service quality and consistency of aid during very complex and difficult times. Such standards provide formal procedures for collaborative decision-making, identify best practices, and enable performance monitoring and issue reporting. These standards also typically include minimum standards for documentation, an operational framework, and oversight to ensure outcomes are being met.

The country follows a number of international guidelines aiming to ensure minimum standards for provision of aid for international groups, including INSARAG guidelines, Minimum Standards for CBRN First Responders, EU Guidelines for Host Nation Support, UN INEE Guidelines, Allied Joint Doctrine for Host Nation Support, and Model Technical Agreement on Liability of Relief Personnel.

This criterion could be improved through reporting protocols that would ensure expenditure tracking and timely movement of relief and aid, as well as processes and internal resources to track and evaluate the quality of international support.

Indicator 5.4.3: Functional Logistics System in Place to Receive International Support

Rationale given by the R2R diagnostic: In a post-disaster environment, tight communication and control will be required to carry out effective and reliable disaster relief coordination. To enable expedited and efficient movement of aid resources, the agency coordinating support should have agreements or memorandums of understanding established with warehouses, airports, and transportation entities before a disaster.

International assistance was received during large floods, including from the Emergency Response Coordination Center. This led to the identification of some challenges in channeling assistance. Organizations used different channels to bring assistance to the country, leading to different standards, degrees of government control, compensation of staff and volunteers, and sharing of assistance.

The R2R found no formal agreements on how to handle and receive incoming disaster aid resources for designated areas, or on where to stage, deploy, and house incoming human resources. However, policies and plans exist for donation management programs; personnel are aware of any preexisting jurisdictional agreements for handling time-sensitive air resources; and agreements have also been reached with the private sector.

The country also adopted the memorandum of understanding on the facilitation of vital cross-border transport. However, the 2014 flooding exposed difficulties around custom exemptions, which initiated a learning process about the value added tax (VAT) and other import taxes for civil protection equipment. An issue remains around VAT on importing donations and equipment, and further attention is needed to clarify the question and ensure alignment with international guidelines.

Indicator 5.4.4: Functional Logistics System in Place to Distribute International Support

Rationale given by the R2R diagnostic: The capacity to distribute aid resources that have been cached in advance of a disaster, or received immediately following a disaster, is vital to managing the consequences of the event and transitioning to recovery. In particular, determining how aid will be prioritized for distribution and identifying redundant distribution channels for remote and/or unreachable areas are important in advance planning.

In general, the Ministry of Security channels relief equipment, food, and non-food items to the Federation of Red Cross and Red Crescent Societies, which distributes the items to the beneficiaries. This approach proved functional during the floods, when warehouse capacities were also strengthened. However, formal agreements with various public and private multimodal transportation operators are absent, and preexisting relationships should be formalized to avoid ad hoc solutions to logistic challenges.

Annex 2

Interview Overview

| Date | Time | Institution | Persons interviewed |
|----------------|-------------|--|---|
| March 9, 2020 | 09:00–10:00 | Ministarstvo sigurnosti Bosne i Hercegovine | Mirnesa Softić Almir Beridan Aleksandar Mandić |
| | 10:00–11:00 | Ministry of Defense of Bosnia and Herzegovina | Radomir Krunić Edin Vladavić |
| | 11:10–12:30 | Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina | Enes Šeperović |
| | 13:00–14:00 | Ministry of Civil Affairs of Bosnia and Herzegovina | Draženka Malićbegović Dušan Kojić |
| | 14:00–15:00 | Delegation of European Union to Bosnia and Herzegovina | Johannes Hintzen |
| | 15:00–16:00 | UNDP | Aida Hadžić Hurem Vedran Ibrulj |
| | 16:00–17:00 | Red Cross Society of Bosnia and Herzegovina | Rajko Lazić |
| March 10, 2020 | 10:00–12:00 | Federal Administration of Civil Protection of the Federation of Bosnia and Herzegovina | Enisa Bajrović Nedžad Bajraktarević Maida Mekić Skrobanović |
| | 13:00–14:00 | Federal Hydrometeorological Institute of the Federation of Bosnia and Herzegovina | Almir Bijedić, Ismira Ahmović |
| | | Sava River Basin District Agency | Almir Prljača Amer Kavazović |
| | 14:00–15:00 | Red Cross of the Federation of Bosnia and Herzegovina | Namik Hodžić Senadin Kumro |
| | 15:00–16:00 | Ministry of Health of Federation of Bosnia and Herzegovina | Almir Prljaca Amer Kavazovic |
| 16:00–17:00 | UNDP | Steliana Nedera | |
| March 11, 2020 | 09:30–11:30 | Department for Public Safety of the Brčko District of Bosnia and Herzegovina | Mirsad Hasanbašić |
| | 12:00–14:00 | Assembly of the Brcko District of Bosnia and Herzegovina - Commission for European Integration | Uroš Vojnović Mihailo Simikić |
| | 13:00–14:00 | Health Department of Brčko District of Bosnia and Herzegovina | Ferid Huseinbegović |
| | 14:00–15:30 | Red Cross of Brčko District of Bosnia and Herzegovina | Denis Šehanović |

| Date | Time | Institution | Persons interviewed |
|----------------|--|---|--|
| March 12, 2020 | 10:00–15:00 | Republic Administration of Civil Protection of the Republic of Srpska | Biljana Pajić Predrag Slijepčević Miroslav Bjelica Dragiša Tešanović Biljana Tomić |
| | | JU Vode Srpske | Miroslav Bosiljčić |
| | | Ministry of Internal Affairs of the Republic of Srpska | Gordana Jerkić |
| | | Ministry of Energy and Mining of Republika Srpska | Borislav Adamović |
| | | Republika Srpska Fire Brigade | Milenko Savanović |
| | | Republika Srpska Amateur Radio Association | Željko Ninković |
| | | Ministry of Trade and Tourism of Republika Srpska | Dalibor Panić Mario Vukić |
| | | Republic Hydrometeorological Institute of Republic of Srpska | Borojević, Darko |
| | | Water Agency of Republic of Srpska | Zoran Lazić |
| | | Ministry of Health and Social Welfare of Republic of Srpska | Kristina Mitrović |
| | | Red Cross of Republic of Srpska | Husein Kličić |
| | Mountain Rescue Services of Republic of Srpska | Milan Ivković | |
| March 13, 2020 | 09:00–13:00 | Ministry of Security of Bosnia and Herzegovina | Mirnesa Softić Aleksander Mandić |
| | 13:30–15:30 | UNICEF Disaster Risk Reduction Unit | Irina Kulenovic |

a. This meeting was canceled.

Annex 3

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