International Telecommunication Union
Development Sector

Brief on Public Early Warning Systems in the Western Balkans

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Disclaimer

The information presented in this document have been gathered by the ITU Office for Europe through desk research and surveys distributed to the relevant stakeholders. A total of 18 responses have been analyzed. While the information provided offers valuable insights, it is important to note that they are not exhaustive and may not fully cover every aspect of the subject matter. Therefore, all the interested parties are encouraged to contribute with additional insights, corrections, or data to enhance the accuracy and comprehensiveness of this working document.

If any entity identifies any incorrect or outdated data within this brief, they are welcome to inform the ITU Office for Europe (eurregion@itu.int), which appreciates any feedback. Additionally, if any entity would like to receive the survey questionnaire to contribute with further insights, please contact the ITU Office for Europe. Every input is precious to ensure that the most accurate and up-to-date information are reflected. Finally, this document is a working document which remains subject to change according to the availability of data.

European context

In Europe, 50 million people have been affected by disasters between 1980 and 2020, with an economic impact of around €12 billion per year.[1]

The Western Balkan countries are highly exposed to natural hazards, the most common being earthquakes, floods, landslides, storms, droughts, and wildfires. Often, these natural hazards have cross-border impact and require a coordinated response.

Examples of some natural hazards that occurred in the Western Balkans in the last 20 years include:

- Albania: 2019, magnitude 6.4 earthquake, causing more than 50 casualties and over 4.000 people forced to leave their homes.[2]
- Bosnia and Herzegovina: 2014, worst flood in 120 years, affecting one-third of the country.[3]
- Montenegro: 2010, severe floods affected the Lake Skadar basin, as well as the Bojana, Morača, and Lim River basins. Approximately 10,000 residents were impacted, with the total estimated damage reaching around €18 million.
- North Macedonia: Summer 2024 wildfires emergency, worsened by heat waves.[4]
- Serbia: 2014, worst flood in 120 years, affecting 38 municipalities with an economic impact of € 1.5 billion.[5]

Looking at the organizational structures of emergency telecommunications, different coordination mechanisms are implemented in each country. The mandate on emergency telecommunication is given to different authorities, depending on the different emergency preparedness and response ecosystem of each country. For example, not in every country, the regulatory agency has a mandate for emergency telecommunications.[6]

In 15.2% of the cases, the mandate for emergency telecommunications is given to a sector ministry; in 21.7% of the cases, it is given to another ministry; in 10.9% of

[1] https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/european-disaster-risk-management_en
[2] https://emergenze.protezionecivile.gov.it/en/seismic/albania-2019-earthquake/
[3] https://www.gfdrr.org/sites/default/files/BiH-rna-report.pdf
[4] https://civil-protection-humanitarian-aid.ec.europa.eu/news-stories/news/eu-mobilises-aid-combat-wildfires-north-macedonia-bulgaria-and-albania-2024-08-02_en
[5] https://openknowledge.fao.org/server/api/core/bitstreams/3d4a7bb9-f73c-4b33-9439-9e805e363e83/content
[6] https://datahub.itu.int/data/?Connectivity=International+roaming&Sustainability=Emergency+telecommunications&i=100083

the cases, it is given to a specialized agency.[7] According to 2022 data, only 23.9% of the countries in the Europe Region have a regulatory or legislative framework on emergency telecommunications or a national emergency telecommunications plan adopted.[8]

In the context of the accession process to the European Union, Article 110 of the EU Directive 2018/1972, also known as the European Electronic Communications Code (EECC),[9] requires all the Member States of the European Union to implement a public warning system by 2022. Following Art. 110 of the EECC, the Body of European Regulators for Electronic Communications (BEREC) published its "Guidelines on how to assess the effectiveness of public warning systems transmitted by different means."

In Europe, multiple cooperation mechanisms are also in place to counter natural hazards. The EU Civil Protection Mechanism is a solid cooperation framework which allows coordinated joint response to maximize emergency response efforts. Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia are all members of the EU Civil Protection Mechanism.[10]

[7] https://datahub.itu.int/data/?i=100083&s=33413&e=5
[8] https://datahub.itu.int/data/?i=100083&s=33419&e=5
[9] https://eur-lex.europa.eu/eli/dir/2018/1972/oj/eng
[10] https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/eu-civil-protection-mechanism_en

Albania

In Albania, the National Plan for Civil Emergency approved by the Decision of the Council of Ministers no. 807 dated 28.12.2023 and the Law no.45/2019 on civil protection represent the legal framework regulating emergency telecommunications. Law no. 54/2024 on Electronic Communications also provides for Mobile Network Operators (MNOs) participation in the context of CBS. Multi-hazard early warning systems (MHEWS) are also covered by the National Plan for Civil Emergency and the National DRR strategy and its plan of action, which provide a roadmap for MHEWS in the coming years.

Albania does not have a CBS in place, but other early warning systems (EWS) have been operational for more than 16 years. Currently, EWS channels include: SMS, television and radio broadcasting. The EWS is operational nationwide, however it requires an update as it does not provide for a centralised system (e.g., CAP Gateway or equivalent) that aggregates and disseminates alerts across different media.

Depending on the degree of risk and its territorial extent, the alert can be activated by the Ministry of Defense, the National Civil Protection Agency, the district prefect, the mayor or other institutions covering critical infrastructures.

Among the major challenges met for the implementation and maintenance of the EWS, there are the lack of funding and the development of SOPs or protocols for roles and responsibilities for maintaining and modernizing the EWS.

The main institutional stakeholders are:

- National Agency for Civil Protection (AKMC)
- Ministry of Defense
- Ministry of Infrastructure and Energy
- Authority of Electronic and Postal Communications (AKEP)

According to 2022 data, the regulator has a mandate for emergency telecommunications.[11]

In Albania, the MNOs who provide access to electronic communications networks and services, are obliged to draft and submit to AKEP a plan for the integrity of public communications and access to public communications services in emergency situations.

[11] https://datahub.itu.int/data/?Connectivity=International+roaming&Sustainability=Emergency+telecommunications&i=100083

With regards to the relationship between the National Disaster Management Authority (NDMA) and MNOs for alert dissemination, these are governed by Law no 54/2024 on Electronic Communications.

At the regional and local level, the authorities inform the population of the risks and provide preparedness guidance while cooperating with national authorities in charge of emergencies on the basis of the National Emergency Plan and Law 45/2019.

Additionally, in Albania, the law recognizes the role of the private sector and NGOs in EWS; however, in practice, they are not involved.

The coordination of the stakeholders occurs via the National Agency on Civil Protection. Additionally, in the last two years, work has been undertaken to adapt Disaster Aware as a national or regional MHEWS platform in cooperation with the Pacific Disaster Center.

Under the National Civil Protection Agency, the National Training Center for Civil Protection provides trainings to public authorities, volunteers and the private sector through its national training program which also includes EWS. The NDMA, municipalities, first responders, local authorities, central agencies, ministries, volunteers, the private sector, and EWS authorities all participate in disaster simulation exercises. There are still coordination challenges because different institutions have different focuses, and the EWS is often considered a secondary responsibility. At the moment, there is no mechanism for community feedback.

In critical situations the State Authority for Geospatial Information can provide geographic information systems (GIS) that could be used during critical situations.

The country aims to improve its early warning systems in the next years. In Summer 2024, Albadapt, a project to establish a MHEWS, was approved. The value of the project is € 35.5 million, and its completion is expected in 2031.[12]

[12] https://www.greenclimate.fund/project/sap041#documents

Bosnia and Herzegovina

Bosnia and Herzegovina currently does not have an EWS strategy or NETP. However, in 2014, the country adopted the document *Risk Assessment on Natural and Other Disasters of the Federation of Bosnia and Herzegovina*.

Bosnia and Herzegovina does not have a CBS in place. Currently existing EWS channels include: sirens, television, radio, Google Alert. The EWS currently in place is not effective and does not provide for a centralized system (e.g., CAP Gateway or equivalent) that aggregates and disseminates alerts across different media. In critical situations, geographic information systems (GIS) are available.

In Bosnia and Herzegovina several institutions are responsible for disseminating alerts; examples include the Civil Protection Administration of Federation of Bosnia and Herzegovina, the Civil Protection Administration of Republika Srpska and the Department of Public Safety of Brčko Distrikt.

The major challenges in the implementation and maintenance of the EWS are the lack of investments and financial resources.

Among the major challenges in the implementation and maintenance of the EWS, there is the lack of a national strategy to integrate legislative and strategic frameworks at the different levels of governance.

There is a need to strengthen multi-sectoral coordination.

The main institutional stakeholders are:

- Civil Protection Administration
- Ministry of Security of Bosnia and Herzegovina [Protection and Rescue Department]
- Ministry of Communication and Transport
- Communications Regulatory Agency of Bosnia and Herzegovina (RAK)

To date, the regulator does not have a mandate for emergency telecommunications.[13]

With regard to the relationship between the NDMA and MNOs for alert dissemination, there are no formal agreements at the national level. General legal obligations are in place for MNOs which have to provide support to the relevant institutions responsible for public protection and rescue.

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13 https://datahub.itu.int/data/?Connectivity=International+roaming&Sustainability=Emergency+telecommunications&i=100083

At the regional and local levels, the authorities have been active in launching public awareness campaigns.

The coordination of the stakeholders is performed at the national level by the Ministry of Security of Bosnia and Herzegovina and at the local level by the respective local authorities. Coordination in emergency situations is regulated by legislation at the entity level and by the *Framework Law on the Protection and Rescue of People and Property in the Event of Natural or Other Disasters in Bosnia and Herzegovina*.

The Ministry of Security of Bosnia and Herzegovina organizes regular trainings in the field of protection and rescue, in accordance with international standards. The Ministry of Security of Bosnia and Herzegovina, in cooperation with civil protection administrations, organizes various types of the exercises including field exercises, table-top exercises or command post exercises with participants joining from rescue teams, civil protection authorities, armed forces, and hydrometeorological institutes among the many. In addition, trainings are also held in cooperation with international partners. Operational centers at regional and local levels also participate in disaster simulation exercises. Despite those efforts, there are still challenges in the coordination of the stakeholders in terms of communication and cooperation among different institutions.

At the international level, Bosnia and Herzegovina, since 2016, has been a member of the EFAS Platform (European Flood Awareness System), which includes the Federal Hydrometeorological Institute (FHMZ) and the Republic Hydrometeorological Institute of the Republika Srpska, as well as the Sava River Watershed Agency (FBiH), the Adriatic Sea Watershed Agency (FBiH) and the Water Agency in Republika Srpska. In addition, Bosnia and Herzegovina signed agreements with all its neighboring countries in the context of early warning systems.

In 2017, the installation of a series of monitoring equipment in the Vrbas River Basin was implemented by UNDP under the project "Technology Transfer for Climate Resilient Flood Management in the Vrbas River Basin."

The UNDP is also currently implementing the *"Scaling up Climate Resilient Flood Risk Management in Bosnia and Herzegovina"* project. The project, which spans from 2023 to 2029, aims to enhance "the use of climate information, flood forecasting, early warning, and emergency response systems to enhance adaptive capacity and resilience of at-risk communities", and it is aligned with the EW4All initiative.

Montenegro

In Montenegro, an important pillar of emergency telecommunications is the Regulation on the content of the plan of measures to ensuring the integrity of public electronic communications networks and the use of electronic communications services in emergency situations ("Official Gazette of Montenegro", No. 050/14 of 28.11.2014).

This Regulation defines the obligations of electronic communications operators who should adopt a plan for the measures in emergency situations no later than November 2025, applicable for the following year. Additionally, the Disaster risk reduction strategy for the period 2025-2030 also covers EWS, MHEWS, and emergency telecommunications. The country has also transposed into its national legislation Article 110 of the EU Directive 2018/1972 (EECC), which requires all the EU Member States to implement a public warning system by 2022, with implications for the MNOs.

Montenegro does not have a CBS in place, but there are plans on advancing with its implementation and some MNOs have the technical capabilities for a CBS. The country currently has the following EWS: sirens, SMS with the GSM mobile telephony standard, television, radio, and mobile apps. In case of SMS broadcast, the average time for dissemination of the alert goes from three hours to two days to reach its destination, and the current EWS in place would be more effective if it could benefit from investments in equipment and new technologies. Depending on the type of emergency, the alert can be activated by the Directorate for Protection and Rescue, the Police, the Ministry of Defense, or the Ministry of Health. Moreover, the EWS does not provide for a centralised system (e.g., CAP Gateway or equivalent) that aggregates and disseminates alerts across different media.

Data unavailability, institutional weaknesses, financial constraints and community engagement are among the major challenges related to the implementation and maintenance of the EWS.

The main institutional stakeholders are:

- Ministry of Economic Development
- Ministry of Interior [Directorate for Protection and Rescue]
- Agency for electronic communications and postal services (EKIP)

According to 2022 data, the regulator has the mandate for emergency telecommunications, from the Law on Electronic Communications, articles 61 and 62.[14]

With regards to the relationship between the NDMA and MNOs for alert dissemination, they are partially covered by the Regulation and the Law on electronic communications; in addition, these relationships are also facilitated by interinstitutional agreements, for example the one between the Police and the MNOs.

The Department for Telecommunication and Information Systems 112 has a series of SOPs, and the Operational Communication Center 112 manages all the communications at the national level during emergencies. In critical situations geographic information systems (GIS) are available.

Representatives of all emergency units, national and local authorities including the Ministry of Internal Affairs and the Directorate for Protection and Rescue, Protection and Rescue Services, the Radio Amateurs Association of Montenegro, the Mountain Rescue Service, and others, all participate in disaster simulation exercises.

[14] https://datahub.itu.int/data/?Connectivity=International+roaming&Sustainability=Emergency+telecommunications&i=100083

North Macedonia

North Macedonia currently does not have an EWS strategy or NETP.

At present, the EWS in place is not effective. Currently, EWS channels include: sirens, SMS, television, and radio. The EWS does not provide for a centralised system (e.g., CAP Gateway or equivalent) that aggregates and disseminates alerts across different media. The alert can be activated by the Protection and Rescue Directorate, the Crisis Management Center, the Ministry of Interior, the Hydrometeorological Service, or the Ministry of Health.

North Macedonia does not have a CBS in place, but the MNOs would welcome this integration and are willing to participate in the process.

The main institutional stakeholders are:

- Crisis Management Center (CMC)
- Protection and Rescue Directorate (PRD)
- Ministry of Digital Transformation
- Agency for Electronic Communications (AEC)

According to 2022 data, the regulator has the mandate for emergency telecommunications.

With regards to alert dissemination, the relationship between the NDMA and MNOs is regulated by the formal Decree from 2018.

At the regional and local level, the Regional Crisis Management Centers are responsible for their respective territory; however, the involvement of authorities at the municipal level in the alerting process is not regulated.

Challenges remain in stakeholder coordination, particularly in communication between institutions and the absence of legislation for municipal-level alerts.

Stakeholder coordination is managed through Standard Operating Procedures (SOPs) and the Coordination Center within the Crisis Management Center. Additionally, a Training Center has been established, though it is not currently operational. Entities such as the Protection and Rescue directorate, the Crisis Management Center, the Ministry of Interior, the Ministry of Defense, the Municipalities, the Red Cross, and the Fire Brigades all participate in disaster simulation exercises.

In critical situations the Crisis Management Center can provide geographic information systems (GIS).

Serbia

In Serbia, a draft strategy for disaster risk reduction and emergency management, which also includes EWS, is currently being developed. Additionally, the Law on Mitigating catastrophe risk and emergency management serves as a key pillar of the country's emergency management framework. The national regulatory framework also incorporates provisions for MHEWS.

Serbia's Early Warning System is fully operational nationwide, providing a centralized platform for aggregating and disseminating alerts across multiple media channels. While a CBS is not yet in place, plans are underway to implement it by the end of 2025.

The current EWS delivers SMS alerts to mobile users in areas affected by natural hazards or technological accidents, following the signing of a memorandum in Autumn 2024. To support its development, a working group comprising the Ministry of Interior, the Ministry of Information and Telecommunications, and the national regulatory authority (RATEL) was established. The system has already been in operation for five months.

EWS alerts are disseminated through various channels, including sirens, SMS, television, radio, and websites, ensuring broad public reach. The system processes SMS alerts at an average rate of 280 messages per second and is designed to manage multiple hazards simultaneously. It is hosted in the national data center, with a dedicated disaster recovery site to ensure resilience.

Additionally, Serbia maintains a siren-based alert system, which undergoes routine testing every three months to ensure its reliability and effectiveness.

Alerts can be activated by alerting authorities responsible for meteorology, earthquake monitoring, ionizing radiation and protection against technical-technological accidents, water management, law enforcement (police emergency department). The Ministry of Interior plays a key role in validating alerts issued by the other authorities before forwarding them to the MNOs. The dissemination process is managed through a dedicated platform under the Ministry of Information and Telecommunications.

The main institutional stakeholders are:

- Ministry of Information and Telecommunications
- Ministry of the Interior [Sector for Emergency Management]
- Regulatory Authority for Electronic Communications and Postal Services (RATEL)

According to 2021 data, the regulator does not have a mandate for emergency telecommunications.[15]

The legal framework mandates the participation of MNOs in the implementation of the CBS. Regarding the dissemination of alerts through the SMS-based system, the collaboration between the NDMA and MNOs is governed by an agreement between the Ministry of Internal Affairs and the Ministry of Information and Telecommunications, which oversees MNOs' operations. At the regional and local levels, the local authorities are involved in the alerting process, and they can establish emergency headquarters to coordinate and manage emergency situations. In addition, the private companies have also been involved in the establishment of the SMS alert system.

In critical situations, the geographic information systems (GIS) can be utilized.

The coordination of the stakeholders occurs via operational centers of the Sector for Emergency Management of the Ministry of the Interior and a dedicated platform provided by the Ministry of Media and Telecommunications.

Discussions on the training of the stakeholders were also conducted during the preparations for the launch of the EWS. Members of the Sector for emergency situations, police, army, local authorities, Red Cross, and various rescue organizations all participate in disaster simulation exercises.

15 https://datahub.itu.int/data/?Connectivity=International+roaming&Sustainability=Emergency+telecommunications&i=100083

Conclusion

The Western Balkans are highly vulnerable to natural hazards such as earthquakes, floods, landslides, and wildfires. These disasters threaten lives, infrastructure, and economies, and effective EWS could significantly mitigate the impact of natural hazards and improve the whole ecosystem of emergency response and preparedness.

The region presents a variety of legal frameworks, with some countries facing challenges in establishing legislative frameworks for alerts at the local level, while others already transposed the EECC into their national legislation.

All countries employ multiple dissemination channels for alerts, including SMS, radio, television, websites, apps, and sirens. Certain countries in the region have begun implementing CBS technology as part of their EWS. However, not all Western Balkan countries have adopted this technology, creating disparities in disaster preparedness in the region.

The biggest challenges in implementing and maintaining Early Warning Systems come down to financial constraints and the difficulty of coordinating multiple stakeholders. Beyond the significant investment required, rolling out a CBS also depends on strong institutional cooperation, including engagement with the private sector.

Effective coordination among stakeholders is particularly challenging due to the diverse mandates of the institutions involved and the sheer number of entities operating at different levels. This often results in a fragmented system, where responsibilities are dispersed, and communication gaps hinder efficient alert dissemination.