



# Enhancing Nature-based Solutions in Montenegro

The role of ecosystems in disaster risk reduction and climate change adaptation

Tanja Popovicki, Verónica Ruiz and Daisy Hessenberger



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## Executive summary

Montenegro is a disaster-prone country particularly vulnerable to climate change, thus affecting multiple sectors – agriculture, biodiversity, energy, forestry, public health, coastal areas and maritime resources, tourism, and water resources. The combination of the rise in frequency and intensity of climate-related hazards and increasing development in the country raises the risks of these hazards, causing substantial economic and health impacts. This uncertain and changing situation is hindering the fulfilment of Montenegro’s environmental, economic and developmental targets.

Montenegro bears the constitutional designation of an ecological state, with an enduring commitment to sustainable development with the preservation of a healthy environment and biodiversity, preservation and improvement of the quality of water, sea, air, soil, space and other natural resources for generations to come.

The Government of Montenegro adopted the National Sustainable Development Strategy (NSDS)<sup>1</sup> in 2017. It serves as a strategic document promoting sustainable development policies and setting long-term guidelines for sustainable development in Montenegro. Even with its strong linkages to both disaster risk reduction (DRR) and climate change, the document was primarily developed within the context of the transposition, implementation and enforcement of the European Union (EU) *acquis*, and does not indicate how the environment, landscapes or ecosystems are to be preserved nor does it provide tangible links to internal and external financial sources for its implementation.

A plethora of other sectoral policy and strategic documents exists, many of which might represent a potential “entry point” for mainstreaming Nature-based Solutions (NbS), such as those governing forests, coastal or water management. However, NbS have still not been considered explicitly or recognised within Montenegro’s policy or strategic framework.

Gender equality is not widely recognised within most sectoral policies in Montenegro, and gender equality issues should be more systematically incorporated into the climate and DRR policies of Montenegro.

The institutional responsibilities for different aspects of climate change, disaster risk reduction and biodiversity are divided among various ministries, national platforms and local governments

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<sup>1</sup> Ministry of Sustainable Development and Tourism (2017). [The National Strategy for Sustainable Development of Montenegro](#). Podgorica, Montenegro: Ministry of Sustainable Development and Tourism.

(especially in regard to DRR), and there are numerous stakeholders with varying interests and competencies in the application and operation of NbS.

The following set of recommendations are defined—for policy and practice—that can be adopted to support the mainstreaming of the NbS approach into policies, and to facilitate the further application of NbS measures and projects in Montenegro.

1. **Intersectoral cooperation and exchange is a key prerequisite for the successful application of NbS.**

Ecosystems are complex systems and their conservation, protection and sustainable management need to be addressed with a cross-sectoral vision. NbS-related matters should go beyond the mandate of a single entity given that their implementation might affect multiple sectors. Hence, NbS needs to be integrated into appropriate sectoral and cross-sectoral plans, programmes and policies, along with measures for climate change adaptation (CCA), disaster risks reduction, conservation and sustainable use of nature and resources, underpinned by strong coordination among the relevant institutions and governmental bodies.

- ✓ Enhance the mainstreaming of NbS and specific NbS approaches into sectoral laws, plans, policies and strategies and ensure strong linkages between DRR and CCA;
- ✓ Strengthen institutional capacities (technical and personnel) for establishing solid coordination and collaboration across sectors while also improving inter-institutional coordination.

2. **Governance arrangements should be based on stakeholder engagement and dialogue**

Stakeholders who are directly and indirectly affected by NbS should be identified and involved in all stages of an NbS project, i.e., from design to implementation. On the other hand, all existing information concerning the NbS project, policy and/or other needs should be compiled and entered into the NbS design, so it can consciously address the targeted societal challenge(s). It is critical to foster sectoral cooperation and cross-sectoral coordination and to ensure communication among government stakeholders, thus ensuring better communication with the broader group of stakeholders.

- ✓ Enhance dialogue and the exchange of data and information on policy goals and objectives among sectors and/or institutions pertaining to NbS (climate change, environment, energy, agriculture, forestry, DRR);
- ✓ Promote NbS among wider groups of stakeholders to ensure their understanding and commitments for building resilience and resolving societal challenges through application of the NbS approach.

3. **Emphasise the many benefits provided by NbS while advocating for their implementation.** Promoting and advocating for more effective utilisation of the potential offered through the application of NbS approaches should consider their overarching goal to address global societal challenges, and the potential to substantially contribute to multiple global frameworks and targets. Their ability to provide multiple benefits while addressing DRR and CCA should be emphasised.
  - ✓ Increase awareness of NbS and its unlocked potential by stressing the contribution these projects can have towards achieving multiple targets/goals, while also serving as a reporting mechanism;
  - ✓ Promote the development of scientific studies, analyses, surveys, and projects on NbS through their connections to the three pillars: science, policy and practice.
  
4. **Enable tangible links to internal and external resources (financial, material, institutional) for implementation of policies and strategies related to DRR.** Reducing the vulnerabilities in each sector is possible via targeted policy interventions, developing and enforcing robust environmental or climate legislation, and encouraging the involvement of civil society and the general public in working to mitigate the effects of climate change and DRR. In order to achieve this, cost-effective strategies for climate adaptation and risk reduction and management ought to be integrated into development planning and public investment.
  - ✓ Improve capacities in disaster risk management and response through training, since there is experience but no technical knowledge, e.g., on understanding disasters and their impacts;
  - ✓ Ensure that coordination and knowledge of specific roles and responsibilities within DRR is substantially improved.
  
5. **Designing tailored policies – spatial and temporal scales.** While there are policy measures already in place to deal with climate change and disaster risk reduction, most are inadequate to the scale of the future threat. When designing this type of measure, it is important to consider the spatial and time scale and to recognise the complexity of both the landscapes and future uncertainties, particularly in a changing world. The proposed policies, based on NbS, have to be designed with a long-term sustainable vision, and aligned with cross-sectoral, national and other policy/regulatory frameworks.
  - ✓ Systematise and improve existing processes, procedures, timelines and methodologies that lay the foundations for the proper design and implementation of NbS;



- ✓ Establish cross-border partnerships on the generation and use of climate change data and their integration into development and other plans.

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*Authors*

## Acronyms

BUR	Biennial update report
CBD	Convention on Biological Diversity
CCA	Climate change adaptation
CSO	Civil society organisation
DRR	Disaster risk reduction
EEA	European Environment Agency
EPA	Environmental Protection Agency
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCF	Green Climate Fund
GDP	Gross domestic product
GHG	Greenhouse gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GVA	Gross value added
IPPC	Integrated pollution protection and control
IUCN	International Union for Conservation of Nature
MRV	Measurement, reporting and verification
NbS	Nature-based Solutions
NDC	Nationally Determined Contribution
NSDS	National Sustainable Development Strategy
RCC	Regional Cooperation Council
Sida	Swedish International Development Cooperation Agency
SDG	Sustainable Development Goal
TNC	Third National Communication under UNFCCC
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe

## 1. Purpose and methodology of the scoping study

The overall purpose of this scoping study (hereinafter: Study) is to provide the state-of-the art of the **Montenegrin national context with regards to the application of Nature-based Solutions (NbS) approaches for climate change adaptation (CCA) and disaster risk reduction (DRR).**

The main objectives of this Study are to: 1) analyse the national institutional, policy and legal contexts that enable NbS application, 2) present an overview of natural hazards and disasters in Montenegro and the correlated risks, 3) elaborate on the added benefit of deploying NbS in the given context, 4) identify knowledge, institutional and capacity gaps and barriers for applying NbS, and 5) provide recommendations and entry points for mainstreaming NbS into national DRR and climate change policies and strategies.

The Study relies on the available and accessible data and information extracted from existing documentations on policies, programmes and strategies – from local to global contexts. This compilation is complemented by past and ongoing initiatives, projects and activities in Montenegro on Nature-based Solutions for DRR and CCA to create a comprehensive repository of best practices and lessons learned that support the recommendations and identification of entry points for potential NbS scalability and replicability.

### 1.1 The ADAPT project

The [ADAPT: Nature-based Solutions for resilient societies in the Western Balkans](#) project aims to increase ecosystem and community resilience to climate change and environmental degradation in the Western Balkans. This regional umbrella initiative works with six Western Balkan economies, regional and local partners.

ADAPT contributes to reducing environmental degradation and increasing climate resilience through Nature-based Solutions, while ensuring social and gender equality in the Western Balkan region.

To ensure long-term and balanced outcomes, the project rests on three major pillars:

- ✓ Knowledge enhancement and awareness raising on Nature-based Solutions for disasters and climate resilience across multiple stakeholders – from decision-makers and natural resource managers to local communities – with a specific focus on gender;
- ✓ Mainstreaming climate-compliant and equitable NbS into adaptation and disaster reduction policy related policy instruments; and
- ✓ NbS implementation and scale-up for DRR.

## 2. Introduction

The Western Balkans are among the most vulnerable regions in Europe in terms of climate change and environmental impacts. Extreme events, such as floods, droughts and forest fires, are forecast to occur more frequently and with greater impacts, calling for measures that reduce disaster risks while increasing resilience and CCA. The 2016 European Environment Agency (EEA) report<sup>2</sup> on climate change impacts and vulnerability in Europe considers Southeast Europe and southern parts of the continent as highly prone to climate change effects, as a region with the highest impact of climate change and number of severely affected sectors and domains.

The study on climate change in the Western Balkans,<sup>3</sup> published by the Regional Cooperation Council (RCC) in June 2018, shows an alarming increase of temperature over the whole territory, with a forecast temperature increase of 1.2°C in the near future, destined to warm further by 1.7–4.0°C and even exceeding 5.0°C by the end of the century, depending on global efforts to reduce greenhouse gas (GHG) emissions. Analyses of climate change impacts in the region recognise that human health, safety and the quality of life are highly affected by natural hazards and sectorial weather-related losses, while also identifying agriculture, forestry, water resources and human health as sectors expected to experience the greatest impacts.

As a Mediterranean country, Montenegro is exposed to various natural hazards, including frequent floods, heavy rainfalls and snowfalls, avalanches, windstorms, heat waves, landslides, forest fires, seismic events, droughts, airborne sand from deserts, and certain epidemics that are directly or indirectly related to hydrology, meteorology and the weather conditions. A number of hazards also pose risks across borders in the region, especially floods, forest fires and the dispersion of airborne pollutants.

There is an increasing understanding that nature provides ‘no-regret’ solutions that are cost-effective and can contribute to increasing community resilience beyond society’s capacity to absorb and recover from a single disaster, such as a flood or drought. While still an emerging concept, NbS have clearly demonstrated their value in providing multiple benefits to societies, e.g., in mitigating and adapting to climate change impacts, reducing disaster risks, improving community resilience and livelihoods, and safeguarding ecosystems and biodiversity.

Various approaches support the application of NbS, including green infrastructure (GI), ecosystem-based disaster risk reduction or an Ecosystem-based Approach. Measures facilitating the practical implementation of NbS through policy development and enforcement, stakeholder involvement and

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<sup>2</sup> European Environment Agency (2017). [Climate change, impacts and vulnerability in Europe 2016. An indicator-based report.](#) Luxembourg: Publications Office of the European Union. DOI:10.2800/534806

<sup>3</sup> Vuković, A & Mandić, M. (2018). [Study on climate change in the Western Balkans region.](#) Sarajevo, Bosnia and Herzegovina: Regional Cooperation Council.

building capacities of national institutions and/or local communities are equally important.<sup>4</sup> The IUCN Global Standard for Nature-based Solutions™,<sup>5</sup> launched in July 2020, with its associated guidance<sup>6</sup> operationalises NbS by providing a common language and framework in order to design, verify and scale up NbS applications and policies.

In order to elaborate on the specific context of Montenegro in relation to the opportunities deriving from the application of NbS approaches in addressing some of the above-mentioned climate, community resilience and disaster risks, one has to understand the overall framework for their implementation in Montenegro. NbS is an overarching, crosscutting concept that by definition involves various sectors, as shown in Figure 1.

The climate change and DRR issues penetrate into all relevant sectors, demanding that challenges be addressed through climate adaptation and mitigation measures or actions striving to reduce the risks from disasters.

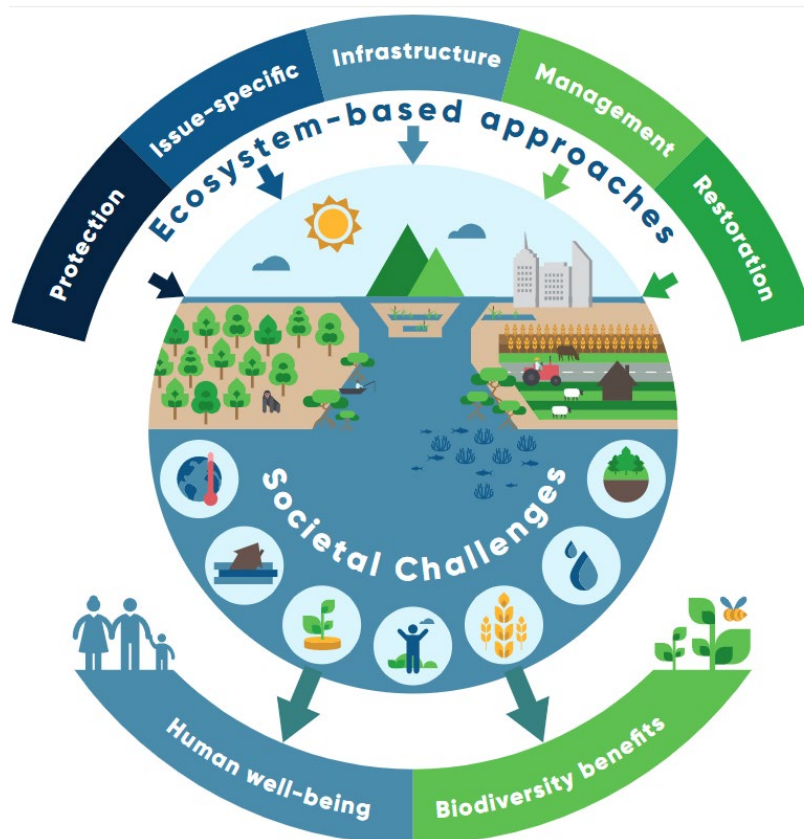


Figure 1. NbS approaches based on the IUCN definition including the seven societal challenges that NbS address (climate change adaptation and mitigation, disaster risk reduction, economic and social development, human health, food security, water security and ecosystem degradation and biodiversity loss (Source: IUCN, 2020, see footnote 5).

<sup>4</sup> Popovicki, T. (2019). *Study on Nature-based Solutions in Serbia*. Belgrade, Serbia: UNDP.

<sup>5</sup> IUCN (2020). *Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. First edition*. Gland, Switzerland: IUCN.

<sup>6</sup> IUCN (2020). *Guidance for using the IUCN Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of Nature-based Solutions*. First edition. Gland, Switzerland: IUCN.



### 3. Montenegro country context and basic data

#### 3.1. Geography

Montenegro is located in Southeast Europe, on the Balkan Peninsula (Figure 2, Table 1). The country covers a surface area of approximately 13,812 km<sup>2</sup>, while the coastline is 293.5 km long.



Figure 2: Physical map of Montenegro (Source: Worldometer, <https://www.worldometers.info/maps/montenegro-map/>)

Montenegro can be divided into three regions: the Adriatic coast and lowlands in the southwest; the central lowland plain with Lake Skadar, and the Zeta and lower Morača Rivers, and the inland mountain region that dominates Montenegro's geography in the west. Most mountainous areas are located in the north of the country, with 37 summits of elevations over 2000 metres.

The deepest canyon in Europe, the Tara River Gorge, is located within these mountains and has a depth of up to 1,300 metres. The mountains descend to the central inland plains and the valleys of the Zeta and lower Morača River. These valleys comprise the Zeta-Bjelopavlići plain with the largest lake on the Balkan Peninsula, Lake Skadar.

Table 1. Montenegro general information (Source: Data compiled by Study authors)

Land border length	614 km
Coastline length	283 km
Total surface area	13,812 km <sup>2</sup>
Territorial sea area	2, 540 km <sup>2</sup>
Agricultural land area	5,145 km <sup>2</sup>
Forest land area	6,225 km <sup>2</sup>

The width of the coastal plains varies from hundreds of meters to several kilometres and comprises approximately 11% of the total national area. Approximately 37% of the national territory is covered by agricultural lands, 45% by forests and 18% by coastal plains, settlements, roads and rocky areas.

The forest cover ratio in Montenegro is 0.9 hectares per person, with an overall timber stock of about 72 million m<sup>3</sup>. Montenegro is categorised as a water-rich country with an average annual runoff of 624 m<sup>3</sup>/s.<sup>7</sup> Montenegro's geography also enables intensive use of land resources for agriculture while limiting exposure to soil erosion, as only 7% of the territory has a slope of less than 5 degrees.<sup>8</sup>

Agricultural land in Montenegro covers an area of 309,241 hectares and accounts for 22.4% of the territory (of which 95.2% is family farms and 4.8% is registered agricultural holdings). This land is highly fragmented.

More than 90% of the land area in Montenegro lies at elevations over 200 metres, 45% is less than 1,000 m, while the mountainous areas over 1,500 m cover about 15% of the territory. The geological structure of Montenegro is characterised by rock of varying ages. Limestone, dolomite, and igneous rocks account for almost two-thirds of the land area. Hydrogeological characteristics are determined by the geological structure of the terrain. Due to the composition of the rocks, precipitation quickly penetrates into the ground, feeding both confined and unconfined karst aquifers that discharge into the zones of erosion bases, the sea, Lake Skadar, and along the rim of the Zeta-Bjelopavlići plain, Nikšić Field, and the area adjacent to the watercourse beds.<sup>9</sup>

Administratively, the country is divided into 23 political-territorial units (municipalities) that perform local governance functions. The capital of Montenegro is Podgorica, which is also the largest city.

<sup>7</sup> [United Nations Development Programme \(UNDP\) \[website\]. Available at https://www.adaptation-undp.org/explore/southern-europe/montenegro](https://www.adaptation-undp.org/explore/southern-europe/montenegro). Assessed on 20 July, 2022.




<sup>8</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>9</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP.

### 3.2. Socioeconomic context

Montenegro regained its independence in 2006 and it has a parliamentary political system. Since 2002, there has been a period of solid economic growth. A far-reaching programme of privatisation has been implemented, public debt has been reduced to a more acceptable level and legislation has been enacted to regulate and liberalise the business environment. Fuelled by a tidal wave of foreign direct investment, a construction boom, flourishing tourism and profit from capital market transactions, significant benefits have been ensured for entrepreneurial and business-oriented citizens (Table 2).<sup>10</sup> Specifically in recent years, Montenegro’s tourist sector has experienced rapid development with an increase in the number of visitors and investments. This also is paired with an increase in the amount of GHG emissions this sector is responsible for.

Table 2. Montenegro basic facts. (Source: [Montenegro Third National Communication on Climate Change 2020](#))

	<b>Population</b>	▲ 621,873 (1st January 2020)
	<b>GDP per capita</b>	▼ \$8,704 (nominal, 2019 est.) ▼ \$20,084 (PPP, 2019 est.)
	<b>GDP by sector (2016)</b>	services: 76.6% industry: 15.9% agriculture: 7.5%
	<b>Inflation (CPI)</b>	0.7% (2020 est.) 8.6% (2018)
	<b>Population below poverty line</b>	▲ 18.1% on less than \$5.50/day (2020f) ▼ 33.7% at risk of poverty or social exclusion (2018)
	<b>Unemployment</b>	▼ 16.1% (2017 est.) ▼ 30.7% youth unemployment (2018)
	<b>Average net salary</b>	€512 / \$574 monthly (November, 2018)
	<b>Life Expectancy at birth</b>	years 76.7 (2017)

Montenegro’s population is experiencing poverty and income inequality. However, conditions have improved in recent years. The at-risk-of-poverty rate in Montenegro was 23.6% in 2017, down 1.6% compared to 2013. There is no significant difference in the risk of poverty between males and females for the years 2013–2017. The population of the northern region is most exposed to the risk of poverty, where 37.9% of the population is at risk of poverty, while the population of the central region has the lowest risk of poverty (15.4%).<sup>11</sup>

<sup>10</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>11</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP.

Furthermore, since 2003, the government has pursued a Poverty Reduction Strategy. Montenegro's potential to position itself to take on emerging issues such as climate change mitigation and adaptation, to promote clean growth, and to take advantage of its green tourism potential are central to the government's vision of the future of the country and its economic development. In terms of gross value added (GVA), the largest contribution in 2030 is expected from the services sectors, mainly from tourism with some recovery in industry, up to 20% in 2020, and 22% in 2030, with a growth in employment of up to 13%.<sup>12</sup> Agriculture is also an important sector. In regard to exports, wine is one of the main products (29% of total agricultural exports).<sup>13</sup>

The socioeconomic context varies greatly between regions, hindering further economic growth. For example, in rural areas, the population is ageing while urbanisation is moving ahead (mostly in central Montenegro). In terms of poverty, there are significant differences between the northern regions and the rest of the country.

The period between 1990 and 2015 was accompanied by major changes in the structure of economic activity. The share of agriculture and industry has significantly decreased in terms of GVA. By 2015, industry had reduced its share of GVA from 20.8% to only 12.9%.<sup>14</sup>

Montenegro bears the **constitutional designation of an ecological state**; hence, sustainable development with the preservation of healthy environment and biodiversity, conservation and improvement of the quality of water, sea, air, soil, space and other natural resources for the generations to come is its enduring commitment.

Montenegro adopted the NSDS<sup>15</sup> in 2017. This represents an umbrella strategy to which all other strategies should be aligned, while also serving as the national answer to all 17 sustainable development goals (SDGs) and 169 targets promoting the sustainable development policies and setting long-term guidelines for sustainable development in Montenegro. The NSDS proposes a set of measures to be achieved until 2030 and provides a platform for translating global targets and indicators of sustainable development into the national framework. These measures touch upon critical sectors, such as the environment, social capital and economy to ensure long-term and sustainable development in Montenegro.

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<sup>12</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2019). [Montenegro Second Biennial Update Report on Climate Change](#). Podgorica, Montenegro: MSDT, UNDP.

<sup>13</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>14</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP

<sup>15</sup> Ministry of Sustainable Development and Tourism (2017). [The National Sustainable Development Strategy of Montenegro](#). Podgorica, Montenegro: Ministry of Sustainable Development and Tourism.

### 3.3. Gender context

Montenegro is a parliamentary democracy where gender equality is recognised in its legal and policy framework as one of the main principles. The Constitution of Montenegro (2007) guarantees the equality of all citizens and provides the opportunity for the introduction of special measures for achieving overall equality, including gender equality. The Anti-Discrimination Law (adopted in 2010, amended in 2011, 2014 and 2017)<sup>16</sup> and the Law on Gender Equality<sup>17</sup> (adopted in 2007 and amended in 2010, 2011 and 2015), accompanied by the Action Plan for Gender Equality 2017-2021, lay the foundation for legal and institutional protection from gender-based discrimination.

The Action Plan for Gender Equality 2017–2021 set out to achieve the following goals: to establish a society of equal opportunities and eliminate all forms of discrimination based on sex and gender, introduce gender sensitive education at all levels, increase the employment of women and eliminate all forms of discrimination against women in the labour market, improve the availability of gender sensitive health protection, suppress all forms of violence against women, improve the position of victims and protect them from gender-based violence, combat stereotypes, introduce gender equality policies into the media, culture and sport, and achieve gender equality in political decision-making at all levels.

Montenegro has ratified international treaties, such as the UN Convention on the Elimination of All Forms of Discrimination against Women and the United Nations' Framework Convention on Climate Change, which promote a gender sensitive approach and encourage the signatory countries to mainstream gender into national sustainable development and climate change policies.<sup>18</sup>

In 2019, Montenegro developed a Gender Equality Index<sup>19</sup> for the first time, aiming to address the existing challenges in assessing the level of achievement set by the Action Plan for Gender Equality 2017–2021 and the NSDS. With an index value of 55 (of the maximum 100 points), the report calls for stronger leadership for institutional transformation, coupled with adequate financial resources, to reduce inequalities between women and men.

### 3.4. Environmental context

Forests cover more than 60% of Montenegro's territory, making it among the top three most forested countries in Europe. At present, around 67% of forests are state-owned. However, ownership is changing in favour of private forest owners.

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<sup>16</sup> Anon (2017). *Zakon o zabrani diskriminacije* (Anti-Discrimination Law) (Official Gazette 42/17). Podgorica, Montenegro: National Assembly of Montenegro. Available at: <https://www.paragraf.me/propisi-crnegore/zakon-o-zabrani-diskriminacije.html>

<sup>17</sup> Anon (2015). *Zakon o rodnoj ravnopravnosti* (Law on Gender Equality) (Official Gazette 35/15). Podgorica, Montenegro: National Assembly of Montenegro. Available at [https://www.ombudsman.co.me/docs/1612165858\\_zakon-o-rodnoj-ravnopravnosti.pdf](https://www.ombudsman.co.me/docs/1612165858_zakon-o-rodnoj-ravnopravnosti.pdf)

<sup>18</sup> Ministry for Human and Minority Rights (2017). *Plan aktivnosti za postizanje rodne ravnopravnosti 2017-2021 sa programom sprovođenja za 2017-2018* (Action Plan for Gender Equality). Podgorica, Montenegro: Ministry of Human and Minority Rights.

<sup>19</sup> Komar, O. (2019). *Gender Equality Index Montenegro 2019*. Podgorica, Montenegro: State Statistical Office of Montenegro (MONSTAT), Ministry for Human and Minority Rights, the European Institute for Gender Equality (EIGE), UNDP in Montenegro.

Protected areas cover 13.41% or 185,269.69 ha of the national territory. The largest areas are the five national parks: Durmitor, Lake Skadar, Lovćen, Biogradska Gora, and Prokletije, which together account for 7.27% or 100,427 ha, while nature parks cover 79,583.10 ha or 5.76% of the national territory.

Water resources in Montenegro drain into two basins: the Adriatic Sea Basin and the Black Sea Basin. There are significant differences in the distribution and abundance of water resources, ranging from arid karst areas to areas rich in both surface and ground water. The country is considered rich in water resources, given that the average annual runoff is 624 m<sup>3</sup>/s (volume of 19.67 billion m<sup>3</sup>).

The southern parts of Montenegro and the Zeta-Bjelopavlići plain have a Mediterranean climate, experiencing hot and somewhat dry summers, with relatively mild and rather humid winters.

The mountainous climate of the central and northern regions of the country is influenced by the Mediterranean Sea, creating large daily and annual temperature ranges, varying from 15.8°C in the south to 4.6°C in Žabljak. The northern and central regions have evenly distributed yet low annual rainfall. The number of sunshine hours per year varies from 2,400 to 2,600 in the coastal regions and from 1,600 to 1,900 in the mountains. The overall annual precipitation of the country is very uneven, ranging from 800 mm per year in the far north to about 5,000 mm in the far south. For example, in the village of Crkvice, located at an elevation of 940 metres on the slope of Mount Orjen, annual rainfall can even reach 7,000 mm in record years.<sup>20</sup>

The Montenegrin Agency for Environmental Protection is responsible for monitoring the state of the environment, including systematic measurement, analysis of quantitative and qualitative environmental performance indicators for air quality, climate change, water, coastal ecosystems, soil, waste management, biodiversity, radioactivity and chemical management.

In addition, Montenegro implements its national Environmental Monitoring Programme<sup>21</sup> that helps experts in preparing the annual report on the state of the environment. The indicator-based annual reports follow the standard typology<sup>22</sup> of indicators developed by the EEA, providing consistency and alignment with reports prepared by other countries on the same topic.

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<sup>20</sup> UNDP [website]. Available at <https://www.adaptation-undp.org/explore/southern-europe/montenegro>. Assessed on 20 July 2022.

<sup>21</sup> Ibid.

<sup>22</sup> Environmental Protection Agency of Montenegro (2013). [\*Indicator-based: State of the Environment Report of Montenegro 2013\*](#). Podgorica, Montenegro: Environmental Protection Agency of Montenegro.



### 3.5. Forests

Forests are a key ecosystem in terms of the services they provide to people. For example, 2.4 billion people depend on forests and wood for energy. The diversity of forest ecosystems in Montenegro (Figure 3) offers a range of services and forestry is a key component of the economy.<sup>23</sup>

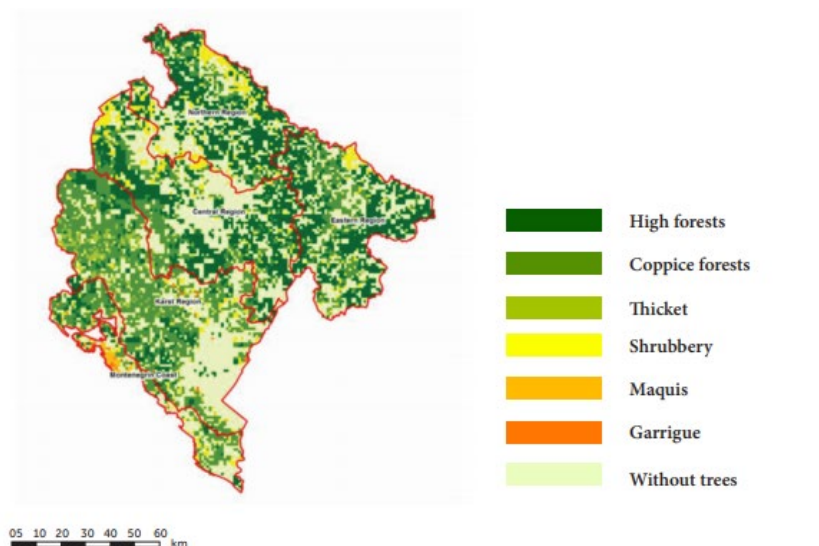


Figure 3. Categories of Forests in Montenegro. (Source: UNFCCC (2019), [Second Biennial Update Report](#))

Forest area in Montenegro was reported at 61.49% of the land area in 2016, according to the World Bank collection of development indicators.<sup>24</sup> State-owned forests and forest land make up 67% of the total surface, while the remaining 33% are privately owned. Figure 4 shows the variation of forest cover by municipality; more detailed data and maps including forest types are provided by the Institute of Forestry. According to the 2010 National Forest Inventory, the total growing stock was estimated at 133 million m<sup>3</sup> with timber production reaching 2.6 million m<sup>3</sup>. Given the importance of forests in the country, a special law ensures the protection, preservation and enhancement of forests planning and use. Although there are data on forests (in terms of value and

<sup>23</sup> Glavonjic, B., Jovic, D., Vasiljevic, A., Kankaras, R. (2005). [Forest and Forest Products Country Profile: Serbia and Montenegro](#). Geneva, Switzerland: UNECE, FAO.

<sup>24</sup> World Bank Open Data [website]. Available at: <https://data.worldbank.org/indicator/AG.LND.FRST.ZS?locations=ME>. Accessed on 12 May 2020.

coverage), the limitation is that these data were obtained using different methodologies during different time periods, making comparisons and macro-economic planning unreliable.<sup>25</sup>

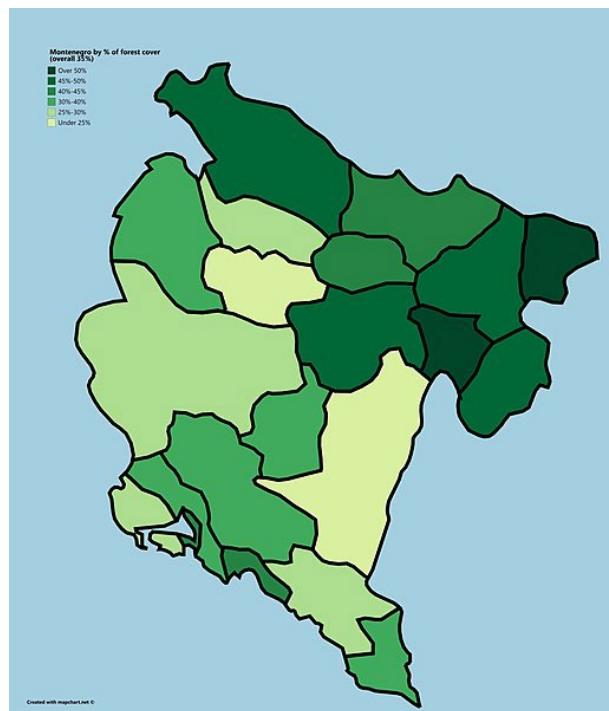


Figure 4. Forest cover of Montenegrin municipalities (Source: Global Forest Watch, [Montenegro Deforestation Rates & Statistics | GFW \(globalforestwatch.org\)](https://globalforestwatch.org/))

Although in some regards (state of preservation, diversity and value), Montenegro's forests are among the best in Europe, they face numerous threats. The Montenegro Second Biennial Update Report on Climate Change (Second BUR) identifies threats such as illegal felling, road construction, changes in land use, and forest fires, with fires listed as the greatest threat.<sup>26</sup> Previous threat assessments have also included pests, diseases and abiotic factors such as drought, floods, frost, snow and strong winds.<sup>27</sup>

### 3.6. Water

In terms of water resources, Montenegro is in a unique position as one of the most water-rich countries in Europe. Globally, Montenegro ranks in the top 4% of countries for average outflow, and since 95.3% of Montenegro's waterways originate in its territory, water is one of the country's greatest natural resources.<sup>28</sup> Although this paints a very positive picture, this does not consider water quality, the specific allocation of these resources, and the consistency of water provision. A key challenge is the inadequate infrastructure in terms of water supply.

<sup>25</sup> Andelić, M., Dees, M., Pantić, D., Borota, D., Šljukić, B. & Čurović, M. (2012). [State of Forest Resources of Montenegro](#). *Agriculture & Forestry*, 3 (57), 39-52.

<sup>26</sup> Ministry of Sustainable Development and Tourism (MSDT) and United Nations Development Programme (UNDP) in Montenegro (2019). [Montenegro Second Biennial Update Report on Climate Change](#). Podgorica, Montenegro: MSDT, UNDP.

<sup>27</sup> Food and Agriculture Organization of the United Nations (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>28</sup> Globevnik, L., Snoj, L., Šubelj, G. and Kurnik, B. (2018). [ETC/ICM Technical report 1/2018 – Outlook on Water and Climate Change Vulnerability in the Western Balkans](#). Magdeburg, Germany: ETC/ICM, UFZ.

There are three freshwater ecoregional units: Dalmatian, South-east Adriatic, and Dniester-Lower Danube Ecoregions.

### 3.7. Agricultural land

In Montenegro, agriculture is the most important sector in rural areas,<sup>29</sup> with 309,241 hectares (22.4% of the territory) registered as agricultural land in 2019.<sup>30</sup> This can be split into five agro-ecological areas.<sup>31</sup> The coastal region is made up of deep alluvial talus and brown anthropogenic soil suitable for fruit/vegetable production and raising small ruminants. Honey plants, herbs and wild fruits are key products. In the Zeta-Bjelopavlici region, the lowland territory has different types of crop production including wine, fruit, vegetables, and cattle raising. In the karst region, arable land is scarce by comparison and is found mainly in the karst fields, depressions and valleys. Here the agriculture mostly consists of livestock (goats, sheep and cattle) and beekeeping. Meanwhile, the north mountainous region, mostly consisting of highlands and plateaus, produces mostly grains, potatoes, cabbage and livestock. Finally, the Polimlje-Ibar region boasts of having much fertile land and freshwater springs, and it is of key importance for vegetable/fruit cultivation and cattle breeding.

Agricultural land in Montenegro is predominantly family farms (95.2%) with only 4.8% of lands registered as agricultural holdings. This land is highly fragmented and is generally characterised by poor utilisation of natural resources. Due to depopulation in rural areas, forests are encroaching, turning pastures and meadows into forest land. The increasing prevalence of forest fires is causing damage, in addition to the loss of wood and biomass. There is also a reduction in forest resilience and biodiversity, and the destruction of authentic landscapes and soil structures, all of which have contributed to erosion and serious degradation of the land.

### 3.8. Climate change context

A 2018 report on climate change impacts in the Western Balkans published by the RCC shows that while the entire Balkan Peninsula is experiencing a significant increase of temperature, the most pronounced signal was over Montenegro.<sup>32</sup> An analysis of the observed climate change in Montenegro demonstrates that the country has experienced changes in climate events and that extreme weather and a rising temperature trend is increasing over time. In recent decades, a range of climate changes have been recorded, all of which pose significant threats to the country and its population:<sup>33</sup>

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<sup>29</sup> Food and Agriculture Organization of the United Nations (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>30</sup> Ministry of Sustainable Development and Tourism (MSDT) and United Nations Development Programme (UNDP) in Montenegro (2019). [Montenegro Second Biennial Update Report on Climate Change](#). Podgorica, Montenegro: MSDT, UNDP.

<sup>31</sup> Ibid., footnote 29

<sup>32</sup> Vuković, A & Mandić, M. (2018). [Study on climate change in the Western Balkans region](#). Sarajevo, Bosnia and Herzegovina: Regional Cooperation Council.

<sup>33</sup> Ministry of Sustainable Development and Tourism (MSDT) (2015). [The Second National Communication of Climate Change – Montenegro](#). Podgorica, Montenegro: MSDT.

- Frequent, extreme maximum and minimum temperatures,
- More frequent and longer heat waves,
- Increase in the number of very warm days and nights,
- Fewer frosty days and very cold days and nights,
- More frequent droughts,
- Increased number of wildfires,
- Dry periods followed by heavy precipitation,
- More frequent storms (cyclones) during colder parts of the year,
- Fewer consecutive days with rain,
- Fewer days with heavy precipitation,
- Increase in the intensity of precipitation,
- Reduced total annual quantity of snow.

The sectors most at risk are water, forestry, and agriculture, and geographically, the coastal areas are highly vulnerable to rising sea levels and a decrease in rainfall.

The last assessment of the economic impact of climate change is from 2010. This analysis identifies factors such as a reduction in the gross revenues from maize sales, increased costs associated with increased crop water demand, decrease in tourist expenditures and in gross revenues from electricity sales from the Mratinje Dam, and additional lives lost due to heat-related mortality.<sup>34</sup> The United Nations Economic Commission for Europe (UNECE) Environmental Performance Review for Montenegro noted that climate change would result in a large structural change in the agricultural sector. The study identified a need for new macroeconomic models, preliminary estimates of climate change damages and better models/data. While there is still no comprehensive model for the economic impacts from climate change, in 2015, UNECE put the total cost for priority adaptation measures at €11.5 million.<sup>35</sup>

Forests in the coastal and central parts of Montenegro are vulnerable to fire due to high air temperature in summers and dry, warm winters.<sup>36</sup> The weather conditions also build up to occasional rockslides and landslides. It is expected that with climate change, various types of extreme weather events will increase in frequency and severity. Predicted climate changes over the coming century include higher temperatures, less precipitation, and a greater risk of floods, droughts, heat waves and forest fire, which may bring a negative impact on water and agriculture sectors of the country and jeopardise the food and water supply. During the periods of 1981–1990 and 2000–2009, strong droughts and elevated summer temperatures were recorded. According to

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<sup>34</sup> Callaway, J.M., Kaščelan, S. and Marković. M. (2010). *The Economic Impacts of Climate Change in Montenegro: A First Look*. Podgorica, Montenegro: Ministry for Spatial Planning and Environment and UNDP Montenegro.

<sup>35</sup> UNECE [website]. Available at <https://unece.org/media/press/1318>. Accessed on 25 August 2022

<sup>36</sup> Grigoryan, A., Becchi, G. and Santos, V. (2011). *Disaster Risk Reduction Capacity Assessment Report*. Podgorica, Montenegro: UNDP.

the available projections, temperatures are expected to rise by 0.6 to 1.3°C by 2030 in different parts of the country, which could lead to further extreme weather and an intense increase in the variability of river flow, resulting in flooding and hydrological drought. Coastal flooding and storm surges are also predicted to increase significantly.

Heat waves are occurring more frequently and lasting longer. It is estimated that the 2012 heat wave in Montenegro affected nearly 4,500 people.

It is expected that climate change will contribute to the increase in frequency and intensity of extreme events, including floods, droughts, wildfires, cyclones, storms, etc., and will bring about many other hazards not directly due to weather conditions, such as landslides. The combination of the increase in frequency and intensity of climate-related hazards and the increase in hazard development in Montenegro constitutes a high economic and health risk.

### **3.9. Disaster risk context**

As a Mediterranean country, Montenegro is exposed to various natural hazards, including frequent floods, heavy rain and snowfall, avalanches, windstorms, heat waves, landslides, forest fires, seismic events, droughts, airborne sand from deserts, and certain epidemics that are directly or indirectly related to hydrology, meteorology and weather conditions. The geographical position of Montenegro as a Mediterranean country adds to the exposure of the country to natural disaster risks. A number of hazards also pose risks across borders in the region, especially floods, forest fires, and the dispersion of airborne pollutants.

According to the Third National Communication on Climate Change (TNC),<sup>37</sup> Montenegro has been exposed and is particularly vulnerable to climate hazards such as droughts, flood, forest fires and heat waves. Predictions indicates that these climate extremes will occur more frequently and be more intense in the future. Droughts have increased in frequency since the 1990s, with four major drought periods occurring between 2003 and 2011. The 2011 drought affected the entire country, causing extreme hydrological deficits in the Zeta and Bjelopavlovića regions, the main agricultural areas, and posing social and economic challenges.

Montenegro's vulnerability to natural disasters could potentially seriously damage the agricultural sector. The surface area of Montenegro is 13,812 km<sup>2</sup>, of which 38% (517,000 ha) is agricultural land. Agricultural production is highly diversified, from olive production in coastal areas, to early seasonal fruits and tobacco in the central parts, to extensive sheep breeding in the northern areas of the country.

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<sup>37</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP.

The average size of agricultural land per farm is 4.6 ha, though it is important to emphasise that 72% of all agricultural farms are smaller than 2 ha and mainly produce for household use.

Agriculture is by far the most important income in rural areas – more than 60,000 households earn their income partially or completely from agriculture.<sup>38</sup>

Alongside the impacts of climate change and extreme events affecting water resources and reliable water supply, soil erosion on forest and agricultural land is due to the general exposure of the terrain, vertical stratification of vegetation, and distinct steep slopes, with the often irrational and inadequate use of natural resources in these areas.

Though water, forestry and agriculture are the most vulnerable sectors to climate change in Montenegro, the entire country is threatened by frequent seismic events, particularly the coastal regions of the Zeta-Skadar and Berane basins. The largest earthquake to hit Montenegro was in 1979, causing 120 fatalities and USD 1.3 billion in damages.<sup>39</sup> There is a high possibility that future earthquakes could create large landslides and rockslides.

Little information is available concerning specific disaster vulnerabilities and capacities. Climate-related hazards and a large number of illegal and irregular construction projects have significantly affected Montenegro's vulnerability. Montenegro represents a case where a rush for growth has triggered haphazard development including expanding human settlements, investments in high-risk coastal areas, and exposure of a greater number of people and assets in the path of floods. All of this generates vulnerability and increases the risk of large-scale damages and fatalities during a disaster.

### 3.9.1 Forest fires

Forests and forest land in Montenegro cover 69.8% (964,262 ha) of the total land area (2013 data).<sup>40</sup> Since the beginning of the 21<sup>st</sup> century, most forest fires have occurred in the coastal and central regions of the country, where the long summer days, dry and hot weather and strong winds from July to September produce the critical conditions for wildfires to start. Furthermore, dry warm winters also contribute to the development of wildfires.

Between 2005 and 2015, there were around 800 large forest fires in Montenegro, with more than 18,000 ha forests and over 800,000 m<sup>3</sup> wood mass damaged or destroyed.<sup>41</sup> Nevertheless, 2017

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<sup>38</sup> European Commission [website]. Available at: [https://agriculture.ec.europa.eu/international/international-cooperation/enlargement/candidates\\_en](https://agriculture.ec.europa.eu/international/international-cooperation/enlargement/candidates_en). Accessed on 10 May 2020.

<sup>39</sup> Policy Commons [website]. Available at: <https://policycommons.net/artifacts/1506632/disaster-risk-profiles/2171207/>. Accessed on 28 August 2022

<sup>40</sup> Food and Agriculture Organization of the United Nations (2014). *Global forest resources assessment 2015 – Country report Montenegro*. Rome, Italy: FAO.

<sup>41</sup> Regional Fire Monitoring Center (2015). *Forest fires country study - Montenegro*. Budapest, Hungary: Regional Environmental Center for Central and Eastern Europe (REC).



was even more devastating, with 124 fires affecting a total of 51,661 ha, six times higher compared to 2016. The largest fire of the year burned 5,687 ha in Danilovgrad in July 2017, but there were also 28 other fires larger than 500 ha.<sup>42</sup>

According to the TNC, analysis of the fire in 2017 demonstrated that the lack of rain affected the water resources, and high temperatures contributed to the spread of the fire, followed by a strong wind. The temperature of 43.9°C in Podgorica on 7 August 2017 was the second-highest temperature recorded in the last 63 years.

The impact of fires in 2017 was estimated as follows:

- Health – watery eyes, coughing, and choking due to large concentrations of dust particles in the air; even four times higher than permitted in Podgorica.
- Forest – the loss of 6,500 hectares of forests due to fires was valued at approximately EUR 6 million according to information from the Ministry of Agriculture and Rural Development.
- Traffic – the traffic on the Podgorica–Cetinje road was periodically closed to enable better access for fire trucks in the village of Dobrsko.<sup>43</sup>

### 3.9.2 Floods

In Montenegro, the most devastating impacts from natural hazards are caused by floods, which are primarily the result of heavy rainfall. A series of cyclones and local instabilities were recorded between 2001–2010, which came together with strong rains, floods, snow precipitation and storm winds. There were three main floods that hit Montenegro in 2007, 2009, and 2010. The damage and loss caused by the 2010 flood was estimated at EUR 44 million (1.4% of gross domestic product (GDP)).

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<sup>42</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP.

<sup>43</sup> Ibid.

The risk of flooding differs greatly across Montenegro. In fact, river valleys prone to flooding occupy a relatively small area, yet these areas are of great importance, containing large settlements, agricultural crop production areas, and major roads.<sup>44</sup> In particular, the Pazicko Polje karst field and the Lim River valley are most prone to flooding (Figure 5). The causes of soil erosion, specifically on forest and agricultural land, are exacerbated by the unsustainable use of natural resources in these areas.<sup>45</sup>



Figure 5. Map of Montenegro showing a flood indicator for 2030 from a study that evaluates the effects of climate change on six hydrological indicators across 8,413 basins in World Bank client countries. Green is low (% change < 5%), yellow is medium (% change between 5% and 15%) and red is high (% change > 15%). (Source: [World Bank Group Climate Change Knowledge Portal - Montenegro](#)).

Heavy rains most frequently affect the Tara and Lim areas from October to March, the cold season. The intensity of heavy precipitation demonstrates decadal variability, except in the northern mountainous region at elevations over 1,000 m, where an increasing intensity was recorded over the past two decades, while the coast and the Zeta-Bjelopavlíci region recorded the heaviest precipitation between 2001 and 2010.<sup>46</sup> This is paired with an increase in the annual average occurrence of sea level anomalies (Figure 6).

According to the UNECE, over 250 km<sup>2</sup> of farmland and urban zones were threatened by predicted flood events in 2015, with most drainage systems not operational due to insufficient maintenance. At the time there were no comprehensive models of economic impacts from climate change for Montenegro, and so the total costs for priority adaptation measures in the most relevant sectors were assessed at EUR 11.5 million.

<sup>44</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>45</sup> Ibid.

<sup>46</sup> Ministry of Sustainable Development and Tourism (2015). [The Second National Communication of Climate Change – Montenegro](#). Podgorica, Montenegro: Ministry of Sustainable Development and Tourism.

The International Disaster Database reported that the damage and losses caused by the 2010 flood alone amounted to around EUR 44 million (1.4% of GDP).<sup>47</sup> The FAO estimated that this flood impacted around 30,000 hectares of agricultural land. The most affected was the area around the Zeta River valley and Lake Skadar, specifically the territory of Golubovci, where most of the national vegetable production occurs. Total agricultural damages and losses were estimated at over EUR 13 million, of which over EUR 6 million was in damages and over EUR 7 million in losses<sup>48</sup>.

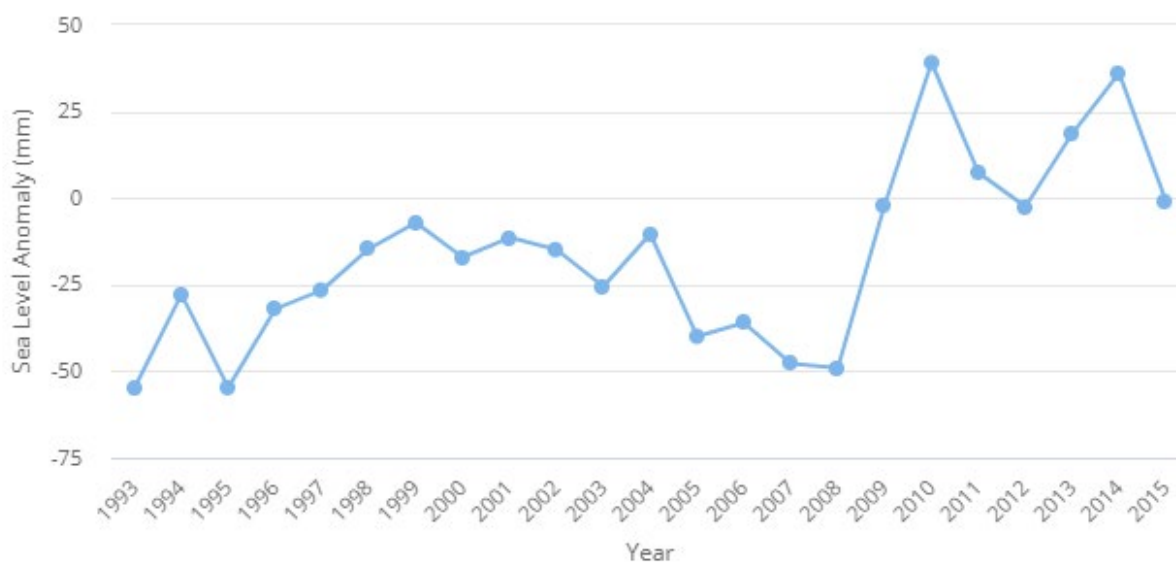


Figure 6. Sea level anomaly in Montenegro, annual average from 1993 to 2015. (Source: [World Bank Group Climate Change Knowledge Portal - Montenegro](#)).

The most recent significant flood was in November 2019, resulting in multiple impacts for people and infrastructure in the municipalities of Nikšić and Kolašin. The total estimated damage from this flood was around EUR 73,000 to households and around EUR 211,500 to infrastructure (e.g., roads, bridges). In Montenegro, flood control has not received much attention, although the consequences are frequently significant.<sup>49</sup>

### 3.9.3 Droughts and heat waves

Drought can have multiple negative impacts on the economy, environment, and human health. The agriculture, forestry, and tourism sectors are most affected by drought. Their occurrence and magnitude are expected to increase in the future due to decreasing rainfall and increasing temperatures, especially during summer and autumn.

<sup>47</sup> The International Disaster Database [website]. Available at: <https://www.emdat.be/> Accessed on 20 May 2020.

<sup>48</sup> Food and Agriculture Organization of the United Nations (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO

<sup>49</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP.

In Montenegro, drought monitoring is based on a standardised precipitation index, remote sensing data, Drought Watch, and a national network of reporters. The 2011 drought evolved into a social and economic challenge that affected the whole country and led to an extreme hydrological deficit in the Zeta–Bjelopavlići region, as the largest agricultural area in Montenegro. These extreme dry conditions led to forest fires in the following year. The frequent and intense drought impacted the quality and quantity of the agricultural yield, revenues, and resulted in high costs to prevent and control the spread of diseases, insects, and weeds, and high costs for irrigation.<sup>50</sup>

Hydrological droughts occurred in 2017, 2018, and 2019, significantly affecting the water levels of important rivers and lakes, particularly the Morača and Zeta Rivers, and Lake Skadar. This resulted in impacts in the fisheries, agriculture, and energy sectors. The agricultural drought during autumn 2017 developed into a hydrological one, and this affected water levels in the rivers and hydroelectric plants. This was also observed in 2018 and 2019. In 2017 and 2018, drought intensity varied from moderate, very arid to extremely arid.

*“The state of biological diversity in Montenegro has been monitored within a limited scope since 2000 by the National Environmental Monitoring Programme, and the wealth of flora and fauna species puts Montenegro among the most biologically diverse countries in Europe, classifying it as a global biodiversity hotspot. Estimates suggest that over 1,200 species of freshwater algae, 300 species of marine algae, 589 species of moss, 7,000-8,000 species of vascular plants, 2,000 fungi, estimates of 16,000-20,000 species of insects, 407 species of marine fish, 56 species of reptile, 333 regularly visiting birds and a high diversity of mammals are found in Montenegro”.  
(Source: [Convention on Biological Diversity](#))*

The monitoring and evaluation of the climate in Montenegro demonstrates that heat waves are increasing in frequency, while their duration shows high year-to-year variability. From the long-term perspective, a trend of continuous increases in the duration of heat waves can be observed. Analyses show that August is the predominant month for long heat waves, whereas June and July see more frequent but shorter heat waves.

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<sup>50</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP.

In the mountainous regions, the overall amount of snow cover will decrease over time compared to the current climate scenario. The impact of extreme precipitation during the period 2001–2010 increased the overall annual snow cover, though this was still only about half the normal amounts.<sup>51</sup>

### 3.10. Nature protection, ecosystem services and land degradation

Montenegro, together with other European countries, houses a rich flora and fauna and highly diverse ecosystems. It is considered one of the most diverse floristic areas in the Balkan Peninsula, with about 3,250 plant species, and the vascular flora species-to-area ratio of 0.837 is the highest in Europe. Of the total of 526 European bird species, 297 (or 57%) can be regularly found in Montenegro, while other species (about 29) are occasionally present.<sup>52</sup>

The following ecosystems can be considered key ecosystems in Montenegro: alpine, forest, dry grasslands, freshwater and marine, while key habitats are: coastal, caves, canyons, and karst as a specific geological formation. While a formal assessment of the risk of collapse of these ecosystems is lacking, the recent Strategy and Action Plan of the Convention on Biological Diversity (CBD) gave an indication of the understanding of threats and the state of these ecosystems as of 2015 (Table 3).<sup>53</sup>

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<sup>51</sup> Ministry of Sustainable Development and Tourism (MSDT) United Nations Development Programme (UNDP) in Montenegro (2020). [Montenegro Third National Communication on Climate Change 2020](#). Podgorica, Montenegro: MSDT, UNDP.

<sup>52</sup> Centre for Climate Adaptation [website]. Available at: <https://www.climatechangepost.com/montenegro/biodiversity/> Accessed on 22 August 2022.

<sup>53</sup> Ministry of Sustainable Development and Tourism (MSDT) (2016). [National Biodiversity Strategy with the Action Plan for the period 2016 – 2020](#). Podgorica, Montenegro: MSDT.

Table 3. Threats and comments on ecosystem health of key ecosystems in Montenegro as documented in 2015 in the CBD Strategy and Action Plan – Montenegro. (Source: [National Biodiversity Strategy with the Action plan for the period 2016 - 2020](#))

	<b>Threats</b>	<b>Ecosystem health status</b>
Alpine ecosystem	Abandoning of traditional cattle breeding, climate change	Satisfactory without a distinct deterioration trend
Forest ecosystem	Illegal harvesting, fires, diseases, air pollution and more	-
Dry grasslands ecosystem	Construction, changes in land use, agriculture and infrastructure development	Endangered and rare
Freshwater ecosystem	Construction on banks, land conversion, waste and wastewater pollution, intense gravel extraction from the basin, intense tourism, hydrotechnical activities and infrastructure, agricultural activities, climate change, unplanned and unsustainable hunting, and illegal harvesting	Can be assessed as good (with some exceptions)
Marine ecosystem	Waste and wastewater (submarine outlets), climate change, pollution from ships, invasive species, and marine accidents	Satisfactory
Coastal ecosystem	Urbanisation and intense tourism, construction, land conversion, infrastructure development, waste and wastewater, and climate change	Endangered and devastated to a certain extent
Caves	Wastewater (cesspools), municipal waste, agriculture and unauthorised visits and use	-
Canyons	Construction of hydro-technical and road infrastructure, pollution caused by waste and wastewater, illegal and unplanned hunting and fishing.	Well preserved
Karst	Wastewater (cesspools), municipal waste and agriculture	-

In 2013, the Government of Montenegro adopted a list of 57 environmental indicators to monitor trends in environmental change and the drivers of change. Of these, 28 were based on the EEA's core set of environmental indicators. However, at present, there are data for only 36 of these indicators, and of these only 29 allow for calculation and projection of trends over longer time spans. This demonstrates that there is a critical need to improve the capacity for systematic data collection, and to link this to evidence-based policy making and planning. An integrated environmental information system is being developed and will be managed by the national Environmental Protection Agency (EPA).<sup>54</sup> The capacity of this and other institutions must be strengthened and gaps in legislation filled regarding frequency and formats for reporting to the EPA by other institutions, together with the development of operational plans and procedures. This also pertains

<sup>54</sup> United Nations Economic Commission for Europe (UNECE) (2015). [Environmental Performance Review Montenegro - Third Review](#). New York and Geneva, UNECE.



to reporting by Montenegro to the EEA, EUROSTAT and the UN Statistical Office, and in relation to the global conventions ratified by Montenegro. The UN has supported and will continue supporting Montenegro in building capacity for the collection and analysis of data as the basis for developing relevant evidence-based laws, regulations, strategies and mitigation measures. The data collected should also be used to monitor the effectiveness of adopted regulations, programmes and investments.

The increase in vegetation in the 20th century is quite remarkable in Montenegro. An examination of land-use changes in Montenegro reveals that the area covered by dense vegetation increased by 21% (from 35% in the early 20<sup>th</sup> century to 56% in 2014).<sup>55</sup> Furthermore, barren areas have decreased by 27% (from 50% to 23%) during the same period. Coastal zone and inland regions of the country have experienced a more striking change than mountainous areas.<sup>56</sup>

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<sup>55</sup> Spalević, V., Čurović, M., Simunic, I, Behzadfar, M., Tanaskovik, V. (2014). Land Degradation, land use and soil erosion: the case of Montenegro. *The Watch Letter, CIHEAM*, 1(28), 58-62.

<sup>56</sup> Nyssen, J., Van Den Braden, J., Spalević, V., Frankl, A., Van de velde, L., Čurović, M., Billi, P. (2012). Twentieth century land resilience in Montenegro and consequent hydrological response. *Land Degradation and Development*, 4 (25), 336-349. <https://doi.org/10.1002/ldr.2143>

## 4. Stakeholder roles and responsibilities

To date no stakeholder mapping that specifically concerns climate change, or the environment in general is available. However, there are stakeholder analyses in regard to protected areas and agriculture related to DRR.<sup>57</sup> These analyses, together with reports from the European Commission<sup>58</sup> and the components of the National Committee listed in Montenegro's Second BUR and TNC, were the basis for identifying stakeholders linked to NbS for CCA and DRR in Montenegro and describing their responsibilities. A full list of stakeholders and their competencies can be found in Annex I.

At the national level, responsibilities for different aspects of climate change, DRR and biodiversity are split among ministries, national platforms and local government (especially in regards to DRR). The Ministry of Ecology, Spatial Planning and Urbanism and Ministry of Economic Development and Tourism could arguably have the most linkages to these topics, while other ministries with key roles include:

- Ministry of Agriculture, Forestry and Water Management with its Directorate for Agriculture, Directorate for Water Management and Water Administration, Forestry Authority, and Forestry Directorate
- Ministry of Capital Investment
- Ministry of Education
- Ministry of Finance
- Ministry of Health
- Ministry of Science and Technological Development
- Ministry of Interior with its Department for Risk Management, Directorate for Emergency Management, Directorate of Emergency, and Police Directorate
- Ministry of Science with its Division for International Cooperation
- Environmental Protection Agency
- Statistical Office of Montenegro
- Directorate of Public Works

While responsibilities and expertise appear to be scattered across ministries, many of these come together in the form of national platforms such as the Administration for Inspection Supervision, Environmental Protection Agency, Institute of First Aid, National and International Climate Action Focal Point, National Council for Sustainable Development and Climate Change, Climate Change and Integrated Coastal Management, National Investment Committee, National Platform for

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<sup>57</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>58</sup> European Commission (2016). [Montenegro Capacity Building and Aquis related Activities for Sector Environment and Climate Action](#). Podgorica, Montenegro: EC.

Disaster Risk Reduction, Operational Protection and Rescue Headquarter, Public Works Administration, Red Cross of Montenegro and the Resource Environmental Community.

The following institutions have key responsibilities concerning DRR: Directorate for Emergency Situations under the Ministry of Interior; Institute for Hydrometeorology and Seismology of Montenegro under the Ministry of Sustainable Development and Tourism, Directorate for Water and the Forestry Directorate under the Ministry of Agriculture, Forestry and Water Management, and Local Authorities – Secretariats involved in water management.

At the scientific knowledge level, there are eminent academic and research entities such as the Centre for Ecotoxicological Research, Institute for Hydrometeorology and Seismology of Montenegro, Institute for Marine Biology, Institute for Public Health, and the University of Montenegro that offers specific programmes related to environment and sustainable development. Nevertheless, there are no widely recognised research groups or communities of practice with strong NbS expertise.

#### **4.1. Stakeholder analysis**

In relation to NbS policy mainstreaming and implementation, stakeholders can be divided into three main groups (based on their interest and influence on NbS and accompanying relevant policies in the field of climate, environment, energy, nature protection and DRR).

##### **Group I – Significantly important**

Governmental institutions, i.e., the line Ministries and state bodies responsible for issues related to climate, environment, water management, forestry, agriculture, DRR, biodiversity, and nature, and having a strong influence in policy development and law enforcement related to NbS, and a strong interest in implementation of the NbS approach in Montenegro.

Considering its competencies concerning emergency situations, the Ministry of Interior should also be included in this group.

Non-permanent governmental bodies such as the National Council for Climate Change and Sustainable Development or National Platform for DRR might be also included in this group, since they could play a significant role and influence advocating for NbS policy mainstreaming.

## **Group II – Important**

These players include governmental institutions such as ministries that are not directly responsible for NbS issues, but have an influence on its implementation, such as ministries responsible for local self-government, finance, education, and more importantly public utility and other public enterprises entrusted with the management of national parks, water, forest resources or coastal management.

All local government bodies with their internal structures should be included in this group, given their responsibilities for implementation of NbS measures and approach in their communities. The Association of Municipalities of Montenegro could be considered an important player, given its intermediary and facilitating role in bridging the gaps between national and local authorities.

Institutions in this group do have a significant influence in this topic; however, this might be because their interest in the topic is not at a very high level.

## **Group III – other**

All other institutions, organisations, individuals or groups with a significantly strong interest in the topic, but with low or very low influence could be included here. These include CSOs, youth and women organisations, academic and scientific (research) institutions, consultants, etc.

## 5. Policy and strategic framework for NbS

Montenegro bears the constitutional designation of an ecological state; hence, sustainable development with the preservation of healthy environment, biodiversity, preservation and the improvement of water, sea, air, soil, landscape and other natural resources for the generations to come is its enduring commitment.

There are over 70 strategic documents and numerous sectoral programs and action plans regulating different policy sectors in Montenegro, and a number of these are relevant for the application of NbS in Montenegro. These documents are outlined in greater detail in Table 4 below.

Table 4. Strategic and policy framework for climate change in Montenegro. (Source: Data compiled by Study authors)

Year of adoption	Title
2014	Energy Development Strategy until 2030
2014	Strategy with the Development Plan of Forests and Forestry 2014–2023
2015	National Climate Change Strategy until 2030
2016	National Sustainable Development Strategy (NSDS) until 2030
2017	Disaster Risks Reduction Strategy with Dynamic Activity Plan for implementation of the Strategy for the period 2018–2023
2017	Water Management Strategy for the period 2016–2035
2019	Traffic Management Strategy for the period 2019–2023
2019	Smart Specialisation Strategy for the period 2019–2023
2021	Nationally Determined Contributions (NDC) for Montenegro

### 5.1. Climate change

The strategic frameworks for climate change issues in Montenegro centre around the overarching National Sustainable Development Strategy,<sup>59</sup> National Climate Change Strategy, First National Communication (2011), Second National Communication (2015), Third National Communication (2020), First BUR (2016) and Second BUR (2019).

The NSDS, as the overarching and umbrella strategic framework, can perhaps be considered the most relevant policy for NbS application, as all other strategies are required to be aligned with it. Meanwhile, the NSDS represents the national answer to all 17 SDGs and 169 targets promoting

<sup>59</sup> Ministry of Sustainable Development and Tourism (2016). *National Sustainable Development Strategy until 2030*. Podgorica, Montenegro: Ministry of Sustainable Development and Tourism.

sustainable development policies and setting long-term guidelines for sustainable development in Montenegro.

The NSDS places the resolution of the specific issues within the four groups of national resources: human, social, natural and economic at the forefront of planning sustainable development. In so doing, it bypasses the sectoral approach and strengthens the multisectoral approach by way of an overarching, comprehending perception of all dimensions of sustainable national development.

Within the natural resources, the NSDS defines the strategic goal of mitigating natural and anthropogenic hazards through a series of measures including better understanding of hazards, institutional strengthening for managing the risks from hazards, increasing investments in reducing risks, and improving resilience of social systems and communities, etc. The document also recognises the necessity for climate change mitigation measures, through building capacities in various sectors including agriculture, health, forestry, water management. The natural ecosystem potential for CCA has been recognised, within the proposed measures for improving knowledge in nature protection and biodiversity. While this obviously implies NbS, the approach as such has neither been incorporated nor integrated.

Therefore, the NSDS has strong linkages to DRR and climate change although tangible links to financial internal and external sources for implementation of NbS are still lacking.<sup>60</sup>

Within the **National Climate Change Strategy 2015–2030**,<sup>61</sup> Montenegro has made the commitment to reduce GHG emissions by 30% to 2030 compared to the 1990 as the base year. This reduction should be achieved through a general increase in energy efficiency, improvement of industrial technologies, increase of the ratio of renewable energy sources and through modernisation of the energy production sector. This Strategy was adopted in 2015 and aims to assessing the institutional framework in place and the technological needs that Montenegro must build for mitigation and adaptation purposes. The document placed a strong focus on alignment with the EU's climate-change legislative framework, as well as mitigation measures, while it is relatively vague on CCA. With regards to DRR, it refers to natural hazards, such as floods and landslides; however, no connection is made between these hazards and climate change.

Key priorities in the energy sector recognised within the **Energy Development Strategy of Montenegro 2014–2030** are energy security, development of a competitive energy market and

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<sup>60</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>61</sup> Ministry of Sustainable Development and Tourism (2015). [Summary of the National Climate Change Strategy 2015-2030](#). Podgorica, Montenegro: Ministry of Sustainable Development and Tourism.

sustainable energy development. Observed by the share of energy sources and fuels in consumption, this Strategy sets the following target values for 2030:

- Solid mass and waste – 8.9%
- Hydro – 11%
- Coal – 21.2%
- Petroleum products – 21.7%

Environmental sustainability and nature conservation has also been recognised as a strategic goal of the **Transport Development Strategy 2019–2035** of Montenegro,<sup>62</sup> whereas CO<sub>2</sub> emissions, noise and pressure on the environment should be decreased by minimising the negative impacts of the development of transport and transport infrastructure.

The **Strategy with the Development Plan of Forests and Forestry (2014–2023)**<sup>63</sup> places a specific focus on the sustainable use of wood resources, the integration of Natura 2000 requirements, and the introduction of an Ecosystem-based Approach to forest management and nature protection. The potential negative effects of climate change on forest ecosystems in Montenegro, seen in the form of droughts, forest fires and biotic pests, has been clearly recognised within the Strategy. Forest fires are recognised as the most adverse risk, based on the period from 2005 to 2010 when fires affected around 1% of the forests in Montenegro annually. This Strategy emphasises the catastrophic fires of 2012 when nearly 7% of the nation's forests were affected. It introduces the obligation for all future forest development plans and forest management plans to include CCA measures aimed at increasing the resilience of the forest ecosystems against forest fires and other negative consequences of climate changes. However, though it proposes only basic prevention measures, such as maintenance of existing open surfaces within forested areas, it can still be considered a foundation for the systematic inclusion of the NbS approach and concrete measures into the national policy framework in Montenegro.

The protection of biodiversity and ecosystem services of forests are recognised as additional strategic goals, due to their potential to improve resilience of forests to the negative impacts of climate change, to further protect of nature, and to raise the potential for further NbS mainstreaming.

The **Water Management Strategy (2016–2035)**<sup>64</sup> emphasises the obligation to protect water resources for the future and ensure their rational use, to protect water resources from various forms of pollution, to establish protected areas, and to conserve aquatic ecosystems. It addresses floods

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<sup>62</sup> Ministry of Transport, Maritime Affairs and Telecommunications (2018). [Transport Development Strategy](#). Podgorica, Montenegro: Ministry of Transport, Maritime Affairs and Telecommunications.

<sup>63</sup> Ministry of Agriculture and Rural Development (2014). *Strategija sa Planom razvoja šuma i šumarstva 2014 2023 (National Forestry Strategy for Montenegro)*. Podgorica, Montenegro: Ministry of Agriculture and Rural Development.

<sup>64</sup> Ministry of Agriculture and Rural Development (2017). *The Water Management Strategy 2017-2035 (Strategija upravljanja vodama 2017-2035)*. Podgorica, Montenegro: Ministry of Agriculture and Rural Development.



from the context of climate change and its impacts on water flows, calling for effective and coordinated action for flood control. The document recognises the impacts of climate changes on increasing the vulnerability of ground waters, changing the water regime, and exacerbating extreme weather conditions and heavy rainfalls that can cause flash floods, torrential flows, landslides and other disasters. The strategy explicitly acknowledges the various adverse impacts of climate change on ground waters, while providing a number of practical adaptive measures.

Though the Strategy does not explicitly refer to NbS, one of its operational goals prescribes that all works on watercourses must be aligned with environmental standards, including measures that clearly call for full compliance with environmental protection criteria and improvement, and the applicability of “nature-based regulation” principles wherever possible. Inner-city and urban watercourses should be further “managed in line with local needs and urban development plans”.

Within the strategic framework, special emphasis is placed on the management of the coastal area of Montenegro. This issue was elaborated through the **National Strategy for Integrated Coastal Zone Management of Montenegro 2015–2030**,<sup>65</sup> which develops the vision of the coastal area as resilient, healthy, attractive, diverse, productive and recognisably unique. This vision is to be realised through:

- more efficient protection of nature and landscapes;
- significant improvements in the efficacy in the management of protected natural assets, ecologically valuable habitats, and coastal zone ecosystems;
- improvements to the environmental status of marine ecosystems;
- improvements to the spatial planning system;
- remediation of pollution due to the inadequate disposal and treatment of solid waste;
- stimulation of green mobility and development of green infrastructure;
- protection and improvement of coastal area resources.

This Strategy, however, fails to adequately address natural hazards such coastal erosion, while it recognises seismic activity and climate change (in part). It calls for more coordination and attention in planning measures that enable free access to the sea and the public use of the coastal space, prevention of coastal urbanisation, and planning activities that are aligned with environmental standards and principles.

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<sup>65</sup> Ministry of Sustainable Development and Tourism, Priority Actions Programme Regional Activity Centre (2014). [National Strategy for Integrated Coastal Zone Management of Montenegro 2015-2030](#). Podgorica, Montenegro: Ministry of Sustainable Development and Tourism.

Though this Strategy covers the period until 2030, it was prepared nearly 8 years ago, and the potential for the application and implementation of Nature-based Solutions was not addressed within the document.

There are also a number of other strategies, laws and regulations related to climate change that do not have direct linkages to NbS. These include those related to renewable energy (generally accepted as a nature-derived solution rather than an NbS) such as the Energy Development Strategy to 2030 with the accompanying 2016–2020 Action Plan, the Programme for Development and Use of Renewables to 2020, the Third Energy Efficiency Action Plan (2016–2018), and the Low-Carbon Development Strategy (2019).

According to the EU Progress Report for Montenegro for 2021,<sup>66</sup> “Montenegro’s level of alignment on climate change remains limited. Montenegro has a climate change strategy in place but has to intensify its work to ensure consistency with the EU 2030 climate and energy policy framework. It also needs to ensure that its strategy is integrated into all relevant sectoral policies and strategies.

The Government of Montenegro adopted the Third National Climate Change Report in the UN Framework Convention on Climate Change in July 2020. Furthermore, in June 2021, the government adopted the Report for preparing the updated nationally determined contributions (NDC) in the frame of the Paris Agreement. The revision of the NDC sets a new target to reduce Montenegro’s GHG emissions by 35% by 2030. This is only a 5% increase from the previous target and should be further stepped up.

“Implementing legislation to the Law on Protection Against Negative Impacts of Climate Change was adopted. The national CCA plan was adopted in April 2021 and the development of the national energy and climate plan started as a basis for the preparation of the low carbon development strategy”.

Within the National Plan of priority activities in mitigation and adaptation to climate change,<sup>67</sup> Montenegro identifies the application and implementation of an NbS for CCA as one of its key priority projects.

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<sup>66</sup> European Commission (2021). [Montenegro 2021 Report](#). Strasbourg, France: European Commission.

<sup>67</sup> Ministry for Ecology, Spatial planning and Urbanism (2021). *Nacionalni program prioriternih aktivnosti u oblasti ublažavanja i prilagođavanja na klimatske promjene u okviru saradnje sa Zelenim klimatskim fondom 2021-2023*. Podgorica, Montenegro: GCF, UNEP.

At the municipal level, the only city to have a climate change strategy in place so far is Podgorica, which published its Climate Change Adaptation Vulnerability Assessment and Adaptation Action Plan in 2016.<sup>68</sup>

An update to the Sustainable Energy and Climate Action Plan of the City of Podgorica, and the development of such action plans for the municipalities Tivat, Kolašin and Pljevlja has been recently initiated through the project EU4 Energy Transition – Covenant of Mayors in the Western Balkans and Turkey, implemented by GIZ in Montenegro.<sup>69</sup>

## 5.2. Disaster risk reduction

Montenegro developed the **National Strategy for Disaster Risk Reduction (DRR)**<sup>70</sup> in December 2017, which is currently an integral part of the Action Plan to ensure its implementation for the period 2018–2023. This Action Plan promotes a revised approach including activities and procedures that jointly address three major areas – sustainable development, DRR and climate change – through various national and local government bodies, indicating that there is some integration of these issues. However, the document lacks an integral approach in addressing natural disasters, and the proposed measures are directed more towards improving organisational and technical capacities in responding to hazards and natural disasters, rather than focusing on their avoidance and prevention.

The Action Plan for 2018–2023 lists 105 activities supported by EUR 34 million in funding. In addition to numerous educational activities and pre-warning measures in cases of emergencies, floods, earthquakes and/or other disasters, the Action Plan does not recognise nature or NbS as a potential solution for preventing disasters. The Plan also predicts the estimation of risks from floods at various levels and/or another disaster.

DRR in Montenegro is mainstreamed through the **National Sustainable Development Strategy (NSDS)** adopted in 2016. Specifically, DRR is outlined as a goal as follows: “*Strengthening resilience, reducing vulnerability and exposure to natural and anthropogenic hazards*”, which is envisioned to be achieved through “*improving the understanding of risks; strengthening the institutional framework of risk management; investing in risk reduction and strengthening the resilience of natural and social systems; improving preparedness for disaster response and reconstruction through recovery, rehabilitation and reconstruction*”.<sup>71</sup> The strategy also mentions

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<sup>68</sup> Capital City of Podgorica, Montenegro: Secretariat for Spatial Planning and Environmental Protection (2015). [Climate Change Adaptation Vulnerability Assessment and Adaptation Action Plan](#). Podgorica, Montenegro: prepared within the framework of the project: Climate Change Adaptation in Western Balkans (CCAWB) implemented by GIZ.

<sup>69</sup> Association of Municipalities of Montenegro [website]. Available at <http://uom.me/2022/07/odrzana-dvodnevna-radionica-na-temu-izrada-akcionih-planova-za-odrzivu-energiju-i-klimu-secap/>. Accessed on 23 August 2022

<sup>70</sup> European Commission [website]. Montenegro | Overview of the National Disaster Management System. Available at: [https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/national-disaster-management-system/montenegro\\_en](https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/national-disaster-management-system/montenegro_en). Accessed on 26 August 2022

<sup>71</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

the Sendai Framework, however, there is a lack of a link between DRR and other sectors in the NSDS, including agriculture where no direct connection is made between the two.

The Second BUR also includes linkages to DRR through the lens of climate change. For example, changes in forest stewardship are linked to numerous positive economic and environmental impacts, including the suppressing of forest fires (although it is not clear how that will be achieved).<sup>72</sup>

In Montenegro, risk identification, assessment and monitoring are mainly organised and implemented at the national level. Montenegro shows a strong institutional structure and linkages to tackle disaster risk related matters. This structure is supported by the National Platform for DRR,<sup>73</sup> established in 2014 and comprising the following multi-sectoral authorities (Figure 7).



Figure 7. National entities and agencies involved in DRR (Source: [UNDRR -National Platforms for DRR](#)).

Moreover, financial constraints remain high and allocation of more financial, technical and qualified human resources to the area of risk identification is critical. In Montenegro, the mandate for raising awareness on DRR is not clearly defined by the legislation. Overall, some awareness raising initiatives have taken place, but there is no systematic public awareness strategy to increase awareness on DRR, or a systematic mechanism for information dissemination to the general public or specialised DRR agencies that would promote risk reduction actions.

DRR is also mainstreamed through the **Water Management Strategy 2016–2035**<sup>74</sup> which deals directly with floods. It prescribes a number of measures, including flood protection, monitoring, forecasting drainage, anti-erosion and soil conservation. Within the **Strategy with the**

<sup>72</sup> Ministry of Sustainable Development and Tourism, (MSDT) United Nations Development Programme (UNDP) in Montenegro (2019). [Montenegro Second Biennial Update Report on Climate Change](#). Podgorica, Montenegro: MSDT, UNDP.

<sup>73</sup> UNDRR-Prevention Web [website]. Montenegro National Platform for DRR. Available at: <https://www.preventionweb.net/national-platform/montenegro-national-platform> Accessed on 25 August 2022.

<sup>74</sup> The World Bank Group (2015). [Water and Wastewater Services in the Danube Region: Montenegro Country Note](#). Washington, USA: The World Bank.

**Development Plan of Forests and Forestry (2014–2023)**, DRR is not systemically mainstreamed and there are no financial resources explicitly available for DRR, though several measures are prescribed to reduce forest fire risks. Those relevant to NbS include building institutional capacities and supporting afforestation.

### 5.3. Gender equality in climate and DRR policies

Gender equality, unfortunately, is not substantially recognised within most sectoral policies in Montenegro. The First BUR recognises gender as a topic that should be mainstreamed and the NSDS sees the gender equality issue only at the level of principles, without a concrete measure for its mainstreaming. This suggests that there are no activities in this direction in Montenegro as yet.

However, some activities linking gender and climate change have been initiated. The 2017 publication “Women and Climate Change in Montenegro” presented the existing gender-disaggregated statistics to be included in its Second BUR and TNC.<sup>75</sup> Based on this gender aggregated data, the following recommendations were made within the Second BUR:<sup>76</sup>

- include an equal number of women and men in decision-making,
- collect gender-disaggregated statistics,
- build capacity to implement gender-sensitive programmes/projects,
- regularly perform gender analyses,
- carry out public information and education campaigns to raise awareness of the impact of climate change on various social groups.

Also in 2017, a regional programme to support gender mainstreaming in the system for measurement, reporting and verification (MRV) toward the UNFCCC was started, including Montenegro. In Montenegro, this programme resulted in the drafting of the Action Plan for Gender Equality 2017–2021 by the Ministry of Human and Minority Rights and the Ministry of Sustainable Development and Tourism. Montenegro defined three objectives within this Action Plan that are interlinked with climate change policy:

1. improve climate change legislation and policy documents (strategies and by-laws) by introducing a gender perspective, and introduce climate change perspective in policy documents related to gender equality;
2. strengthen national institutions to mainstream gender into the climate change transparency framework by assessing the capacities of institutions to interlink gender and climate change as a first step. A set of trainings were also proposed. Nomination of a gender representative

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<sup>75</sup> Statistical Office of Montenegro, Ministry for Human and Minority Rights (2020). [Women and Men in Montenegro](#). Podgorica, Montenegro: Statistical Office of Montenegro, Ministry for Human and Minority Rights.

<sup>76</sup> UNDP [website]. Available at <https://www.adaptation-undp.org/explore/southern-europe/montenegro>. Accessed on 20 July 2022.

into the Working Group on Climate Change within the National Council for Sustainable Development was proposed, and

3. improve the system of collection and analysis of sex-disaggregated data and gender data relevant for MRV and transparency.<sup>77</sup>

The TNC indicates certain progress in understanding the importance of gender mainstreaming into climate policies. Also, after 2020, positive steps forward were seen in political decision-making processes, so the new assembly of the Parliament has more women than the previous one, and 4 of 12 ministerial positions are occupied by women (33%), though both the prime minister and deputy prime minister are men.

Furthermore, several enabling factors for enhancing the efforts to mainstream gender in climate change have been recognised and defined within the TNC. These enabling factors and potential actions include:

- Gender equality in policy making: Engagement of an equal number of women and men in policy-making, decision-making, and the implementation of climate change measures, considering differentiated vulnerability and adaptive capacity;
- Gender-differentiated statistics: Collect and document gender-disaggregated statistics, as a basis for planning gender-sensitive programmes and projects, and as an instrument for monitoring their implementation;
- Institutional capacities: Build the capacities of institutions and of civil society organisations to create and implement gender-sensitive programmes and projects at all levels;
- Conduct public outreach and education campaigns: Raise awareness of the impact of climate change on different social groups and encourage action to help develop civic awareness and solidarity in adapting to and mitigating climate change;
- Strengthen institutional mechanisms: Enhance gender-sensitive mechanisms through the National Council for Sustainable Development, Climate Change and Coastal Zone Management, to mainstream gender into all climate change policies.

Gender equality issues need to be more systematically incorporated into the climate policies of Montenegro. Based on the National Adaptation Plan for cooperation with the Green Climate Fund (GCF),<sup>78</sup> the gender equality policy represents a milestone of the GCF policy, and achievements of more significant results in combating climate changes would not be feasible without the application of a gender-based approach. Through cooperation with GCF, Montenegro is committed to

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<sup>77</sup> UNDP: NDC Support Program [website]. Available at: <https://www.ndcs.undp.org/content/ndc-support-programme/en/home/impact-and-learning/library/gender-mainstreaming-into-climate-transparency-and-measurement-.html> Accessed on 25 August 2022

<sup>78</sup> Ministry for Ecology, Spatial Planning and Urbanism (2021). *Nacionalni program prioritetnih aktivnosti u oblasti ublažavanja i prilagođavanja na klimatske promjene u okviru saradnje sa Zelenim klimatskim fondom 2021-2023*. Podgorica, Montenegro: GCF, UNEP.

complying with the GCF's gender policy and to ensure continuous integration and mainstreaming of gender issues within its climate and overall development strategies and policies.

Within the DRR, gender issues are recognised within the **National Strategy for Disaster Risk Reduction (DRR)**.<sup>79</sup> One of the priority goals strives towards improving readiness for an efficient reaction in the case of disasters, aiming at “building a system that is better than the one from prior to the disaster” in the process of reconstruction, rehabilitation and rebuilding. The Strategy identifies the need for strengthening the capacities of local communities to more efficiently react in the case of disasters, actions that can predict events and integrate risk reduction, and to ensure capacities for effective reaction at all levels of society. The Strategy also clearly indicates that an equal approach to reaction, rehabilitation and recovery needs to be promoted, and emphasises the role of women and people with disabilities as crucial in achieving this goal.

## 5.4. NbS in other strategic documents

### 5.4.1 Biodiversity and nature protection

The state of biological diversity in Montenegro has been monitored within a limited scope through the National Environmental Monitoring Programme since 2000, and the wealth of flora and fauna species puts Montenegro among the most biologically diverse countries in Europe, classifying it as a global biodiversity hotspot. Estimates suggest that over 1,200 species of freshwater algae, 300 marine algae species, 589 moss species, 7,000–8,000 vascular plant species, 2,000 fungi, estimates of 16,000–20,000 insect species, 407 marine fish species, 56 reptile species, 333 regular visiting bird species and a high diversity of mammals are found in Montenegro.

Benefits and ecosystem services arising from biodiversity in Montenegro range from the provision of wood for heating, timber, grazing for cattle, sustaining aquifer stability, soil fertility, protection from erosion, landslides and floods, benefits for tourism, and climate regulation. Although there is potentially great economic value surrounding these services and it can be said that the daily life of most people depends on these ecosystem services, there is little knowledge amongst the general public about biodiversity issues.<sup>80</sup>

Ecosystems are complex systems, so their conservation, protection and sustainable management should be addressed based on a cross-sectoral vision. Environment related matters should go beyond the mandate of a single entity since environmental impacts might affect multiple sectors. Therefore, it is necessary that measures for conservation and the sustainable use of nature and its

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<sup>79</sup> European Commission | Overview of the National Disaster Management System [website]; Available at: [https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/national-disaster-management-system/montenegro\\_en](https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/national-disaster-management-system/montenegro_en). Accessed on 26 August 2022

<sup>80</sup> Convention on Biological Diversity: Country Profile Montenegro [website], Available at: <https://www.cbd.int/countries/?country=me>. Accessed on 24 August 2022.



natural resources are integrated into appropriate sector and cross-sectoral plans, programmes and policies, underpinned by strong coordination among governmental bodies.

A national-level economic valuation of biodiversity and ecosystem services was also carried out in Montenegro to advocate for investments in the National Biodiversity Strategy and Action Plan 2011–2020, demonstrating that its actions and projects would add more than EUR 540 million in value to the economy.<sup>81</sup>

Nevertheless, the strategic framework in Montenegro regarding biodiversity is obsolete. The National Biodiversity Strategy expired in 2020, and the last national report to CBD Secretariat was submitted in December 2018. There are no newer accessible data or national targets for this sector.

#### 5.4.2 Forestry

The **National Forestry Strategy**,<sup>82</sup> along with the **Development Plan for Forests and Forestry until 2023** deals primarily with forests as ecosystems, focusing on their economic value as natural resources. Its main goals are to improve sustainable forest management and to increase the GDP share of forest dependent activities from 2% to 4% of total GDP.

Within the Strategy, there is a niche for further mainstreaming of the NbS approach, since one of the key strategic goals is related to the protection of biodiversity and other ecosystem services, including increasing resilience of forests to the adverse effects of climate change and valorisation of forest ecosystem services.

The document also prescribes measures to improve the stability and quality of forest ecosystems through the integration of Natura 2000 requirements and their inclusion in forest management plans. It also calls for improved coordination among state and local institutions, private forest owners, public and private companies, CSOs and other actors involved in forest management and nature protection.

Further space for NbS mainstreaming lies within the prevention and control of forest fires and adaptation to climate changes, as mentioned within Section 5.1.

#### 5.4.3 Water management

The **Water Management Strategy for 2016–2035** includes an evaluation of the current situation in the area of water management, together with goals, objectives and guidelines for elaborating measures to be implemented according to projections for sustainable water resources and

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<sup>81</sup> Emerton, L., Kaludjerovic, J. and Jovetic, I. (2011). [The Economic Value of Protected Areas in Montenegro](#). Podgorica, Montenegro: GEF, UNDP.

<sup>82</sup> Ministry of Sustainable Development and Tourism (MSDT), United Nations Development Programme (UNDP) in Montenegro (2019). [Montenegro Second Biennial Update Report on Climate Change](#). Podgorica, Montenegro: MSDT, UNDP.

management. Water management and floods go hand in hand, which is why floods are included in the rationale of the strategy and thus a set of measures are identified to tackle and cope with effective and coordinated action for flood control, efficient and continuous monitoring and forecasting of floods, prevention of erosion and soil conservation. This is also an opportunity for their further enhancement and upgrading through the implementation of Nature-based Solutions in addition to the traditional flood control infrastructure.

## 6. Experiences with NbS

It was possible to identify several interventions in Montenegro that have a potential to be an NbS for CCA and/or DRR, or that could support the further mainstreaming of NbS (for example by building capacities or gathering data). However, **there is no clearly “recognisable” NbS project implemented in Montenegro so far.** Some of the projects identified in Montenegro that use NbS approaches are listed below:

- projects involving restoration, conservation and/or sustainable management (e.g., protection and preservation of the water and natural resources of the Tara River);
- capacity building projects (e.g., preserving biodiversity and sharing responsibility);
- projects focusing on stakeholder engagement (e.g., protected areas for nature and people);
- projects in both a rural and urban context (e.g., eco and outdoor tourism actions of the Balkan Alps, and the campaign *Making cities resilient*).

A detailed list of existing or past projects that could be considered as NbS is given in Annex II: Projects complementary to NbS.

## 7. Conclusions and recommendations

Montenegro is a disaster-prone country that is particularly vulnerable to climate change (see Sections 3.8 and 3.9). This affects multiple sectors – agriculture, biodiversity, energy, forestry, public health, natural resource management, and tourism. The increase in the frequency and intensity of climate-related hazards, together with the increasing economic development in the country, constitutes a higher risk to greater and sustained economic and health impacts for nature and people. This uncertain and changing situation hinders the achievement of Montenegro’s environmental, economic and developmental targets – at both the national and global levels.

Risk identification, assessment and monitoring are mainly organised and implemented at the national level. However, the financial constraints remain high and the allocation of financial, technical and qualified human resources to the area of risk identification is critical. In Montenegro, the mandate for raising awareness on DRR is not clearly defined by the legislation. Overall, some awareness raising initiatives have taken place, but there is no systematic public awareness strategy to increase awareness on DRR, or a systematic mechanism for information dissemination to the general public or specialised agencies on DRR that would promote risk reduction actions.

The NSDS, as an overarching and umbrella national development policy document has strong linkages to both DRR and climate change. The strategy is primarily developed within the context of the transposition, implementation and enforcement of the EU acquis. An increase in the frequency of droughts, erosion and heavy rainfall are mentioned as a result of climate change; however, the document does not indicate how the environment, landscapes or ecosystems will be preserved, nor does it provide tangible links to internal or external financial sources for its implementation.<sup>83</sup>

According to the 2021 EU Progress Report for Montenegro, “Montenegro’s level of alignment on climate change remains limited. Montenegro has a climate change strategy in place but has to intensify its work to ensure consistency with the EU 2030 climate and energy policy framework. It also needs to ensure that its strategy is integrated into all relevant sectoral policies and strategies.”<sup>84</sup>

A plethora of other sectoral policy and strategic documents exists and many of those might represent a potential ‘entry point’ for the mainstreaming of Nature-based Solutions. In the forestry sector, the current Strategy proposes only simplified preventive measures against forest fires, such as maintenance of existing open surfaces within forest areas. However, it should be considered as a basis for the systematic inclusion of the NbS approach and concrete measures into the national policy framework in Montenegro. Besides forest fires, the protection of biodiversity and ecosystem

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<sup>83</sup> Food and Agriculture Organization of the United Nations (FAO) (2018). [Comprehensive analysis of the disaster risk reduction and management system for agriculture in Montenegro](#). Podgorica, Montenegro: FAO.

<sup>84</sup> European Commission (EC) (2021). [Montenegro 2021 Report](#). Strasbourg, France: EC.

services of forests are recognised as strategic goals due to their potential to improve resilience of forests to negative effects of climate change and to improve nature conservation, therefore presenting the potential for further NbS mainstreaming.

One of operational goals of the Water Management Strategy prescribes that all watercourse interventions needs to be aligned with the environmental standards, and this includes measures that clearly call for full compliance with the criteria for environmental protection and improvement, and applicability of the “nature-based regulation” principles wherever possible. Watercourses within cities and urban areas should be further managed in line with local needs and urban development plans.

Gender equality, unfortunately, is not substantially recognised within most sectoral policies in Montenegro. The First BUR recognises gender as a topic that should be mainstreamed and the NSDS sees the gender equality issue only at the level of principles, without concrete measures for its mainstreaming. Thus, gender equality issues need to be more systematically incorporated into both climate and DRR policies of Montenegro. Within the DRR Strategy, for example, the role of women has been recognised, but the tangible definition and measures on how their roles should be strengthened and their need incorporated is lacking.

## 7.1 Recommendations for NbS mainstreaming and application

An overarching goal of NbS is to address global societal challenges and their potential is to substantially contribute to multiple global frameworks and targets: Sendai Framework, SDGs, Paris Agreement and/or the forthcoming Global Post-2020 Biodiversity Framework. While addressing DRR and CCA, Nature-based Solutions will also provide multiple benefits in other domains, while also safeguarding nature. NbS can also be used to contribute towards achieving multiple targets/goals, and as a reporting mechanism. The *IUCN Global Standard for Nature-based Solutions*<sup>TM</sup> provides guidance on how to design and monitor NbS interventions. The application of NbS requires comprehensive analysis and research based on the context of the specific location or site/territory and iterative decision-making processes that facilitate the selection of the best available and most cost effective and efficient (also feasible) option.<sup>85</sup>

This section provides a set of recommendations that can be adopted in order to support mainstreaming of the NbS approach into the policies, and to facilitate further application of NbS measures and projects in Montenegro.

1. **Intersectoral cooperation and exchange is a key precondition for the successful application of NbS.** Ecosystems are complex systems; therefore, their conservation,

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<sup>85</sup> Popovicki, T. (2020). [Study on Nature-based Solutions in Serbia](#). Belgrade, Serbia: United Nations Development Programme.

protection and sustainable management needs to be addressed with a cross-sectoral vision. NbS-related matters should go beyond the mandate of a single entity, since their implementation might affect multiple sectors. Hence, it is necessary that NbS, along with measures for CCA, DRR, conservation and sustainable use of nature and resources are integrated into appropriate sectoral and cross-sectoral plans, programmes and policies, underpinned by strong coordination among the competent institutions and government bodies.

- ✓ Enhance the mainstreaming of NbS and specific NbS approaches into sectoral laws, plans, policies and strategies and ensure strong linkages between DRR and CCA;
- ✓ Strengthen institutional capacities (technical and human) for establishing constructive coordination and collaboration among sectors and to improve inter-institutional coordination.

2. **Governance arrangements should be based on stakeholder engagement and dialogue**

Stakeholders directly and indirectly affected by the NbS should be identified and involved in all stages of the NbS intervention. On the other hand, all existing information concerning the NbS intervention, policy and/or other needs need to be compiled in order to feed it into the NbS design, so it can consciously address the targeted societal challenge(s). It is critical to foster sectoral cooperation and cross-sectoral coordination and to ensure communication among government stakeholders, thus ensuring better communication to a broader group of stakeholders.

- ✓ Enhance the dialogue and exchange data and information on policy goals and objectives among sectors and/or institutions affected to NbS (climate change, environment, energy, agriculture, forestry, DRR);
- ✓ Promote NbS among wider groups of stakeholders ensuring their understanding and commitments for building resilience and resolving societal challenges through application of the NbS approach.

3. **Emphasise the many benefits provided by NbS while advocating for their implementation.**

Promoting and advocating for more effective use of the potential offered from NbS approaches should consider its overarching goal to address global societal challenges, and its potential to substantially contribute to multiple global frameworks and targets. Their ability to provide multiple benefits while addressing DRR and CCA should be highlighted.

- ✓ Increase awareness on NbS and its unlocked potential by stressing its contribution towards achieving multiple targets/goals, as well as serving as a reporting mechanism;

- ✓ Promote the development of scientific studies, analyses, surveys, projects on NbS through their connections to the three pillars: science, policy and practice.

4. **Enable tangible links to internal and external resources (financial, material, institutional) for the implementation of policies and strategies related to DRR.**

Reducing vulnerabilities in each sector is possible via targeted policy interventions, developing and enforcing robust environmental or climate legislation, and encouraging the involvement of civil society and the general public in working to mitigate the effects of climate change and DRR. In order to achieve this, cost-effective strategies for climate adaptation and risk reduction and management ought to be integrated into development planning and public investment.

- ✓ Improve capacities in disaster risk management and response (through training) considering that there is experience but no technical knowledge, for example on understanding disasters and their impacts.
- ✓ Ensure that coordination and knowledge within the DRR of specific roles and responsibilities is substantially improved.

5. **Designing tailored policies – spatial and temporal scales.** Though there are some policy measures in place to deal with CCA and DDR, the majority of these measures are inadequate to the scale of the future threat. When designing this type of measure, it is very important to consider the spatial and temporal scale, and to recognise the complexity of the landscapes and uncertainties, particularly in a changing world. The proposed policies, based on NbS, have to be designed following a long-term sustainable vision and aligned with cross-sectoral, national and other policy/regulatory frameworks.

- ✓ Systematise and improve existing processes, procedures, timelines and methodologies that lay the foundations for the design and implementation of NbS;
- ✓ Establish cross-border partnerships on mechanisms for the production and use of climate change related data and their integration into development plans.



## Annex I: Stakeholder responsibilities

Stakeholder group	Institution	Division	Responsibilities
Academia / Research Centres	Centre for Ecotoxicological Research		Unite environmental protection issues in one institution and organise the monitoring of all environmental segments (air, water, soil, waste, ionising and non-ionising radiation, noise, etc.)
	Institute for Marine Biology		Dedicated to marine research, and grouped into several areas: biological, ecological, taxonomic and hydrographical research of marine life.
	Institute for Public Health		Data providers
	University of Montenegro		Offers specific programmes related to environment and sustainable development related to NbS and its different societal challenges (i.e., principal and legal aspects of environmental protection, environmental impact assessments, environmental monitoring design and planning in environmental protection). Academia and research stakeholders are key for compiling NbS evidence-based research important for shaping decision and policy messaging.
Government bodies	Ministry of Agriculture, Forestry and Water Management (MAFWM)		Development of norms and definition of support models to encourage the development of agricultural production is a continuous process and permanent activity of the MAFWM. This is performed with the active participation of agricultural producers, CSOs, professional services, and the scientific community, and with active international support and cooperation.
		Agriculture Directorate	Provides sectoral expertise (Data collection, Compilation, Analysis Policy direction and evaluation: Mitigation, Adaptation, Finance).
		Directorate for Water Management and Water Administration	Responsible for water management, and the planning and implementation of protection measures and infrastructure. It is charged with preparing water management plans for each river basin on the basis of the flood risk assessment. According to the Law on Water, the Directorate is responsible for the implementation of the European Union Water Framework Directive (WFD) and the Floods Directive. The technical capacity and human resources of the Directorate are insufficient. Its activities are carried out principally on a project basis using external resources. It provides sectoral expertise (Data collection, Compilation, Analysis Policy direction and evaluation: Mitigation, Adaptation, Finance)
		Forestry Authority	Data provider specifically in regards to agriculture, forestry and land use data.
		Forestry Directorate	Adopts a forest management programme for each management unit. Performs administrative tasks and implements activities related to ensuring and improving the state of forests and forest management; restoration, protection of forests and forest lands; monitoring implemented measures in forest management;

Stakeholder group	Institution	Division	Responsibilities
			professional supervision and quality control; and keeping records and a forestry database/information system.
		<b>Ministry of Culture</b>	Protection and valorisation of national cultural heritage, Inspections on cultural heritage sites, Promotion of cultural and artistic creativity, Public information and awareness on cultural heritage, Media and International cooperation
		<b>Ministry of Defence</b>	Role in the National Platform for DRR
		Armed Forces of Montenegro	Develop specific capacities for assistance in case of disasters.
		<b>Ministry of Ecology, Spatial Planning and Urbanism</b>	Serves as the custodian of natural resources, biodiversity and space of Montenegro. Its priorities are: environmental protection, care for clean air, water, land and climate change, preservation of the nation's exceptional spatial heritage.
		Directorate for EU Integration, International Cooperation and Climate Change	Performs duties related to proposals, monitoring and instructing policies within the EU negotiations on Chapter 27 – Environment and Climate Change, including coordination among institutions and alignment of the national legislation with the EU acquis in the field of climate change; implementation of international and multilateral agreements. Implementation, monitoring and reporting of all relevant international bilateral and multilateral agreements and international conventions related to climate change (UNFCCC, Kyoto, Montreal Protocols, Vienna Protocol on ozone-depleting substances, etc.)
		Environment Directorate	Prescribes, monitors and directs policies in the protection of environment (air, water, and soil), management of waste, municipal services, chemicals, as well as occurrences and activities: ionising and non-ionising radiation, nuclear and radiation safety, industrial pollution, noise and vibrations, and the development of strategic, planning and other development programs, action plans and projects.
		Nature Directorate	Proposes, monitors and directs policies in nature protection, including the development of relevant strategies and other development programmes, legal acts and other legislation in nature conservation and protection.
		<b>Ministry of Capital Investments</b>	Performs administrative tasks related to the preparation and evaluation of development investment projects of interest to Montenegro in the fields of energy, mining, transport, and maritime affairs. Implements development policy, monitors the situation and takes measures in these areas.
		<b>Ministry of Education</b>	Education policies, strategies and sector planning including budget planning, functioning of the national education system, school exams and others.

Stakeholder group	Institution	Division	Responsibilities
	<b>Ministry of Finance</b>		Responsible for public finances and sharing competencies related to the INSPIRE Directive and with the land administration (also responsible for establishing the national geospatial data infrastructure).
		Statistical Office of Montenegro	Conducts statistical surveys on forestry, water use and protection against the pollution in industry, irrigation systems, public water system and public sewage, municipal and industrial waste. Provides sectoral expertise (Data gathering, Compilation, Analysis Policy direction and evaluation: Mitigation, Adaptation, Finance) specifically in terms of energy balance, agricultural production, agriculture structure, waste statistics, and industrial production.
	<b>Ministry of Health</b>		Responsible for drinking water quality and health-related advice to the public regarding air quality issues, and the management of medical waste. Participates in the National Platform for DRR.
	<b>Ministry of Interior</b>		Provides sectoral expertise (Data gathering, Compilation, Analysis Policy direction and evaluation: Mitigation, Adaptation, Finance). Participates in the National Platform for DRR.
		Department for Risk Management	Performs risk assessments for drought and floods. Responsible for the management of the national database of risks as reported by the National Strategy for Emergency Situations. Responsible for the drafting and development of strategic documents and plans at the national level, cooperation with scientific bodies (universities), laboratories and other research institutions.
		Directorate for Emergency Situations	Responsible for risk assessments, rescue and risk management, disaster protection and emergency remediation management. This enables unified prevention, preparedness and response to natural, technical, technological, and other disasters. Carries out public awareness raising campaigns, particularly among children, pupils and students, people with disabilities and citizens in risk prone areas. The Directorate organises visits of the 112 Centre and presentations at schools to raise awareness.
		Police Directorate	Develops specific capacities for assistance in case of disasters.
	<b>Ministry of Science</b>		Responsible for scientific research strategies and sectoral planning, participation in international research programmes, monitoring of scientific research activities and public information on scientific research and results. Participates in the National Platform for DRR.

Stakeholder group	Institution	Division	Responsibilities
	<b>Ministry of Economic Development and Tourism</b>		Activities are directed at enhancing competitiveness, the investment environment, and cooperation with the business community. The business environment is continuously being improved, facilitating business operations for small and medium-size enterprises and strengthening entrepreneurship. A business-friendly climate is being created, laying the foundation for development of a modern Montenegrin industry. Strategic planning of tourism development is pursued, developing sustainable, green, smart and inclusive year-round tourism in accordance with modern trends.
		Centre for Ecotoxicological Research	Participates in the National Platform for DRR
		Institute for Hydrometeorology and Seismology of Montenegro (IHSM)	The main actor related to hydrological, meteorological, environmental and marine observations, monitoring and services. According to the Law on Hydrometeorological Activity, IHMS has the mandate to monitor weather and waters; collect and analyse hydrometeorological data and data on water and air quality; prepare forecasts and inform and alert responsible agencies. Data provider responsible for climate data tracking, including analysis of climate scenarios and support in the assessment of vulnerabilities by sector experts. Provides sectoral expertise (Data gathering, Compilation, Analysis Policy direction and evaluation: Mitigation, Adaptation, Finance) specifically in terms of climate, air (quality, temperature, wind), water (flooding, wastewater, fresh water, precipitation, drought), and sea (levels, temperature). Participates in the National Platform for DRR.
	<b>Ministry of Transport and Maritime Affairs</b>		Conducts state policy-making in the field of climate change. Responsible for establishing indicators, prevention and taking emergency measures in case of marine pollution from vessels, marine fuels, noise action plans for major roads, emissions from cars and vans.
Local government	Association of Municipalities of Montenegro		<p>Deals with environmental issues including municipal waste management, water supply and wastewater treatment through public utility companies. Municipalities are also responsible for:</p> <ul style="list-style-type: none"> <li>• maintaining local registers of polluters and performing environmental impact assessments and strategic environmental assessment procedures for projects and plans or programmes of local significance;</li> <li>• promulgation and protection of protected areas (level III);</li> <li>• acoustic zoning and noise mapping for agglomerations;</li> <li>• construction of infrastructure, obtaining technical requirements and revision of public utility services in the sectors of water supply, waste water management, communal (municipal) waste management, public lightening, public transportation, etc.</li> </ul>

Stakeholder group	Institution	Division	Responsibilities
National Platforms and Networks		Administrative Inspection	In charge of supervision pursuant to the Law on Inspection that prescribed the methods and procedures for inspection, duties and powers of inspectors, and other issues of importance. The Administrative Inspection consists of different inspectorates including, among others, Ecological Inspection, Hunting Inspection, Water Management Inspection, Forestry Inspection, and Fishery Inspection.
		Environmental Protection Agency	Responsible for GHG Projections and Inventory, ensures implementation of Environment and Climate Action. Its mandate includes the implementation of strategies, programmes, laws and regulations in the field of environment, implementation of international treaties within its jurisdiction, environmental permitting, environmental impact assessment, strategic environmental assessment, IPPC licensing, environmental monitoring, keeping relevant registers and databases, and reporting and coordination of reporting on the state of the environment. Also responsible for the provision of information to national and international organisations and to the public. Participates in the National Platform for DRR.
		Institute of First Aid	Main institution responsible for coordination and management of emergency situations and DRR. Conducts risk assessments for disasters, coordinates and cooperates closely with the central and local institutions, CSOs, civil society, private sector, etc. Participates in the National Platform for DRR.
		National Council for Sustainable Development and Climate Change	Chaired by the President of Montenegro and the members are almost all ministries and bodies relevant for DRR. Monitors the implementation of the NSDS.
		National Council for Sustainable Development, Climate Change and Integrated Coastal Management	A high-level, multi-institutional council, chaired by the President of Montenegro, which focuses on sustainable development. The council was established by the government in 2008, marking a positive development in inter-institutional coordination and cooperation. The 2013 reform strengthened its mandate in the field of climate change, as a strategic priority of the government towards the creation of a low-carbon society. In 2016, it was renamed to its current name. Stakeholder consultation indicates that the council deals with climate change, but focuses more on mitigation than on adaptation.
		National Investment Committee	Set up to coordinate capital investment activities; highlighted the investment priorities for environment in the recently adopted Single Project Pipeline that will serve as a basis for programming and blending of all available financial sources.

Stakeholder group	Institution	Division	Responsibilities
	National Platform for Disaster Risk Reduction (DRR)		The Sendai Framework for Disaster Risk Reduction stresses the need for better governance of risk, in which the state has the primary role in reducing disaster risk. Building resilience to disasters also brings together the responsibilities of many sectors, stakeholders and levels of governance. For ensuring effective coordination and action, national level governance mechanisms gathering national Sendai focal points are key. In Montenegro, this is the National Platform for Disaster Risk Reduction (DRR) composed of the following entities: Ministry of Interior, Ministry of Defence, Ministry of Sustainable Development and Tourism, Ministry of Agriculture and Rural Development, Ministry of Health, Ministry of Science, Institute of First Aid, Institute for Public Health, Red Cross of Montenegro, Hydrometeorology and Seismology Institute, Agency for Environmental Protection and the Centre for Ecotoxicological Research.
	Operational Protection and Rescue Headquarter		Responsible for rescue and risk management, disaster protection and emergency remediation management. This enables unified prevention, preparedness and response to natural, technical, technological, and other disasters.
	Public Works Administration		Performs technical activities related to construction, reconstruction, rehabilitation and renovation of primary technical infrastructure, buildings of state authorities, health, education, culture and sports, and complexes and buildings in attractive tourist locations and other facilities which are financed by the state
	Red Cross of Montenegro		Special responsibilities in case of armed conflict, epidemics, ecological and other natural disasters.
	Resource Environmental Community		A key stakeholder that supports transformational changes towards a greener economy and sustainable development through awareness raising and regulatory/policy reforms.
CSOs	Centre for Bird Protection and Research of Montenegro		This Podgorica based CSO has already implemented more than 40 projects in animal and wildlife protection, biodiversity, education on the environment and sustainable development, nature conservation, sustainable and eco-tourism.
	Chamber of Commerce of Montenegro		Represents the interests of all entrepreneurs for the economic and overall development of Montenegro.
	Dinaric Arc Parks		This network consists of 90 protected areas in Albania, Bosnia and Herzegovina, Montenegro, Croatia, Kosovo, Macedonia, Slovenia and Serbia.
	Green Home		Podgorica-based CSO includes 400 members. Its work is related to air quality, air pollution, animal protection and wildlife biodiversity, certification and labelling, energy and/ renewables, energy efficiency, education on the environment and sustainable development, environmental legislation, nature conservation, sustainable development, green consumption, sustainable and eco-tourism, urban environment, waste issues, and water issues.

Stakeholder group	Institution	Division	Responsibilities
	MedCEM26: Mediterranean Centre for Environmental Monitoring in Sutomore (Montenegro)		Raises awareness on ecosystems in the Adriatic Sea, coastal region and Skadar Lake. Implements activities related to management, application of knowledge and provision of technical support in field of nature conservation, data collection, analysis and presentation of information related to ecology and sustainable development.
	Montenegrin Employers' Association		Contributes to improvement of the business climate and elimination of business barriers providing a wide variety of services to its members.
	Nautilus, Kotor		This CSO deals with animal protection, wildlife, biodiversity, and environmental education, education for sustainable development and water issues.
	Greens of Montenegro (CSO Zeleni Crne Gore)		Some activities include the organisation of international expert meetings (e.g., Energy in the Ecological State) and round tables (e.g., Sustainable Development in Montenegro, Place and Role of Small Hydroelectric Power Stations in Montenegro, Technologies and Treatment of Solid Waste), organisation of clean-up activities for Long Beach in Ulcinj, Breznica riverbed in Pljevlja, etc., development of the project idea Eco Agro Tourist Village Bijela - Savnik; development of a concept design on Ecological Protection of Lake Biogradsko.
Public enterprises	Centre for Ecotoxicological research		Deals with the analysis of soil, sediments, surface water, groundwater, seawater, wastewater and drinking water, and fish for export, monitoring of air, ionising radiation, noise, vibration and radon pollution.
	PROCON		In charge of managing internationally financed projects concerning municipal services and environmental protection, providing logistical support to municipalities.
	VODACOM		Project implementation body; this is a joint service and coordination company for Water and Waste Water Services for the Montenegrin Coast and the Municipality of Cetinje, established in March 2005, by the Government of Montenegro and the Municipalities of Bar, Tivat, Herceg Novi, Budva and Kotor.
	National Parks of Montenegro		Institution includes all five national parks in Montenegro (Biogradska Gora, Durmitor, Lovćen, Prokletije and Lake Skadar). It is a member of the European Federation of National Parks - EUROPARC.
	Public Enterprise for Coastal Zone Management		Responsible for monitoring the bathing water quality on beaches, international cooperation and participation in international projects, promotion of environmental protection, participation and cooperation with local municipalities and national agencies in management of protected areas and other environmental issues.



## Annex II: Projects complementary to NbS

Name	Lead Organisation	Location	Resource	Description	Comments and additional resources
<a href="#">Enhancing the conservation of coastal wetlands</a>	MAVA	Salinas in ULCINJ	Action	Aims to restore damaged habitats, encourage sustainable water use and reduce the impacts of water abstraction, pollution and coastal development on wetlands and related marine habitats by building capacity for effective management and planning processes, raising awareness of the importance and value of coastal wetlands, and demonstrating local solutions in different contexts. One pilot site in Montenegro.	
<a href="#">Preserving biodiversity and sharing responsibility</a>	GIZ	Shkodra/ Skadar Lake	Action	Conservation and sustainable use of biodiversity at Lakes Prespa, Ohrid and Shkodra/Skadar. The lakes' natural resources are managed on a transboundary basis and in compliance with EU environmental and biodiversity protection targets. The project focuses on four action fields: sustainable fisheries, transboundary cooperation, biodiversity conservation and transboundary water resources management in line with the EU WFD. Capacity building lies at the core of the project's mission.	More than 200,000 people will benefit from the implementation of the developed Programme of Measures for Lakes Shkodra/Skadar and Prespa.
<a href="#">Protected Areas for Nature and People (PA4NP)</a>	WWF	Biogradsk a Gora National Park	Capacity building	Four-year programme funded by Sida is laying the foundation for the engagement of local communities in the management of protected areas. It will introduce examples of how protected areas can generate social and economic benefits in cooperation with the local community. These examples will be taken from the field work of WWF Adria and their partners in Bosnia and Herzegovina (Una and Sutjeska National Parks), Kosovo (Germia protected area), Montenegro (Biogradska Gora National Park) and Serbia (Fruška Gora, Djerdap and Tara National Parks, Gornje Podunavlje Strict Nature Reserve, and the Avala protected landscape). Each field project will bring new experience; from new tourism products and new business potentials to education and bear monitoring and watching.	<a href="#">Further information available here.</a>
<a href="#">Together for sustainable forests</a>	Green Home	National	Action	Sustainable forest management means managing forests and forest land in such a way as to preserve biodiversity, while keeping the productivity, regeneration, vitality and potential of forests at a level that would meet the environmental,	Funded by the Ministry of Agriculture and Rural Developme

Name	Lead Organisation	Location	Resource	Description	Comments and additional resources
				economic and social needs of present and future generations, both locally and at the national level. In order to manage forests sustainably, serious attention must be focused on reducing illegal activities in forestry, but also the vulnerability of forests to fires, climate change and irrational use of forest resources. The main objective of the project is to support sustainable forest management through networking and joint action of all stakeholders: institutions, private forest owners, civil society and citizens.	nt and lasts 7 months (August 2020 to March 2021).
<a href="#">Performing the Integrated Environmental Management Plan at local level in the Shkodra Lake Ecosystem</a>	Green Home	Shkodra/ Skadar Lake	Action	The final goal of the project is to develop a management plan and monitoring programme for Lake Skadar.	
<a href="#">Protection and preservation of the water and natural resources of the Tara River</a>	Green Home	Tara River, Mojkovac and Kolasin municipalities	Action	Aimed at identifying and assessing the hydro-morphological state of the Tara River and implementation of measures for controlling pollution and revitalising natural characteristics and protection of the fish fund, within its flow in Montenegro (146 km). The project aims to improve the status of degraded watercourses, improve capacities and protect the native fishery in the area of Mojkovac and Kolasin municipalities, and to strengthen awareness among the local population about the importance of preserving the water and sustainable use of river resources.	

Name	Lead Organisation	Location	Resource	Description	Comments and additional resources
<a href="#">Together for Better Climate</a>	Green Home	National	Capacity building	The overall objective of the project is to empower the civil society in Montenegro to influence the EU approximation process through strengthening public participation in decision-making in the field of climate change. The specific objective is to build the capacities of CSOs in Montenegro to be active players in the approximation processes and to influence policies related to climate change through capacity building support for smaller CSOs with a focus on climate change, energy and sustainable development. The project plans to improve the capacity of environmental CSOs in policy development, policy research and public advocacy (for the contribution to the EU integration process in the field of climate change) as well as to increase the legitimacy of CSOs on climate change and energy policy and enhance dialogue with national stakeholders (national and local governments, experts, business and media).	
<a href="#">Sava and Drina Rivers Corridors Integrated Development Project</a>	World Bank	Sava and Drina Rivers	Action	The development objective of the Sava and Drina Rivers Corridors Integrated Development Programme is to <b>improve flood protection and enable transboundary water cooperation</b> in the Sava and Drina Rivers Corridors. The project consists of four components, will be implemented over a 10-year period, organised in two phases. The sub-projects in Montenegro will be managed by a Project Implementation Unit within the Ministry of Agriculture and Rural Development.	
<a href="#">Water Resource Strategies and Drought Alleviation in Western Balkan Agriculture (WATERWEB)</a>	FAO	National	Capacity building	The project promoted the institutional mainstreaming and <b>strengthening of capacities in the agriculture sector with regard to DRR and CCA</b> at the regional, national and municipality levels. Awareness was raised, capacities enhanced and information and knowledge shared among the different stakeholders. Specifically, this was achieved by: (i) developing technical capacities and tools for better planning and implementation of risk reduction measures in agriculture, (ii) harmonising the post-disaster needs assessment methodology, including assessment of damage and losses, with international	<a href="#">Guidelines available here.</a>

Name	Lead Organisation	Location	Resource	Description	Comments and additional resources
				standards, and (iii) identifying, testing and validating good practices for DRR in agriculture that can help to reduce the impact of floods, landslides and droughts, such as the use of crop rotation, intercropping, agroforestry, mulching, drip irrigation, as well as landscape and ecosystem interventions.	
<a href="#">Eco and Outdoor Tourism Actions of the Balkan Alps</a>	European Green Belt	Prokletije Mountains	Capacity building	Three training sessions on biodiversity were organised for mountain guides to familiarise participants with forest species, and large carnivores like brown bears and wolves. Guides were also introduced to bird species and the important aspects of birdwatching as one of the most popular activities of tourists in that area. The training was also an opportunity for the local mountain guides to recognise the potential to create different tourism products and attract a new target audience of tourists.	
<a href="#">Making Cities Resilient Campaign</a>	UNISDR	Municipality of Cetinje	Capacity building	By signing up to this campaign, Cetinje can expect to further raise awareness at the national (and international) level, to prompt more support and <b>financial investment in DRR and CCA measures</b> . This can secure better coordination between the national and local level and directly translate into practical implementation.	
<a href="#">Green Cities</a>	EBRD	Podgorica	Action	Podgorica will be able to strategically address the city's needs for sustainable and green growth. The plan will address the most pressing <b>climate change and environmental challenges</b> , including public building energy efficiency, urban roads and lighting, urban transport, water and wastewater, and improve energy and resource efficiency and promote climate change adaptation in order to reduce local pollution.	
<a href="#">CCA through Transboundary Flood Risk Management in the Western Balkans</a>	GIZ	Drin River Basin	Capacity building	The project focuses on the Drina River Basin and supports institutions at national and local levels in Albania, Kosovo, Montenegro and North Macedonia. Transboundary <b>flood risk management</b> is strengthened with regard to climate change. The project currently acts in three key areas: Flood Hazard and Risk Mapping, Early Warning, and Institutional development.	

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<a href="#">safEarth</a>	EC	International	Action	Transnational advanced <b>management of land use risk</b> through landslide susceptibility maps design. Led by the Croatian Geological Survey, safEarth developed an online landslide susceptibility mapping (LSM) system that allows any potential or occurring disasters to be mapped in real time.	



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