PROPOSAL

Climate Change Adaptation Plan 2025 – 2035

with the Action Plan 2025 – 2027

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Glossary

Term	Definition
Adaptive capacity	The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences (IPCC, 2018).
Climate change	A change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.
Climate change adaptation	The process of adjustment to actual or expected climate and its effects. In human systems – including with regard to infrastructure – adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.
Climate co-benefits	The benefits – including social, environmental, and economic - that climate adaptation and disaster risk management investments would yield even in the absence of climate change or disaster risk.
Disaster risk	The likelihood of loss of life, injury or destruction and damage from a hazard, including hazards driven or amplified by climate change, in a given period of time.
Disaster risk reduction	A systematic approach to identifying, assessing and reducing the risks of disaster.'
Disaster risk management	Application of policies, strategies, and other actions to prevent new disaster risk, reduce existing disaster risk, and manage residual risk, contributing to the strengthening of resilience, mitigation of disaster impacts, and reduction of disaster losses.
Hazard	The potential occurrence of a natural or human-induced event with the potential to cause loss or damage to life, livelihood, physical infrastructure, services, and health or wellbeing.
Exposure	The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected by a hazard (IPCC, 2018).
Impact	The consequences of an outcome or outcomes.
Resilience	Ability of a system or community exposed to hazards or related exogenous shocks and stressors to resist, absorb, accommodate, adapt to, transform, and recover from their effects in a timely and efficient manner through structural and non-structural measures.
Sensitivity	Susceptibility of a population, assert or ecosystem to be harmed in the event of exposure to a hazard.
Vulnerability	The propensity or predisposition of a population, asset or ecosystem to be adversely affected by a hazard. This is a function of sensitivity and adaptive capacity (IPCC, 2018).

Executive Summary

Montenegro is among the countries already significantly exposed to the consequences of climate change. Rising temperatures, the frequency of extreme weather events, droughts, floods, and the degradation of natural resources increasingly threaten human health, food and water security, infrastructure, and economic development. In line with these needs, as well as international and national obligations, Montenegro initiated the development of the Climate Change Adaptation Plan (hereinafter referred to as CCAP or the Plan), also known globally as the National Adaptation Plan (NAP), for the period 2025-2035.

The Plan was developed based on: a comprehensive analysis of the existing national and sectoral strategic and planning documents; sectoral climate vulnerability and risk assessments; analysis of institutional capacities and gender aspects; and extensive consultations with stakeholders from the public, civil, and academic sectors. The process was further guided by key principles such as: the principle of alignment, the principle of financial sustainability, the principle of responsibility, the principle of cooperation, the principle of transparency, the principle of continuity, and the principle of efficiency and rational planning. The Plan also relies on the principle of just resilience, which ensures equal access and even distribution of adaptation benefits for all social groups. Methodologically, the development of the CCAP was based on the current regulatory framework, primarily the Decree on Methodology and Procedure for Drafting, Aligning, and Monitoring the Implementation of Strategic Documents (Official Gazette of Montenegro no. 54/2018), as well as guidelines from the Methodology for Policy Development, Drafting and Implementation of Strategic Documents.

As climate change is expected to affect several different sectors in Montenegro, which requires a coordinated and strategic approach to address these challenges, the CCAP has been developed with the aim of serving as a basis for public policies focusing on managing the key climate risks faced by Montenegro. It establishes a systematic framework for managing climate risks through planning, implementation, and monitoring of adaptation measures.

The CCAP focuses on strengthening Montenegro's resilience and enhancing its capacities for climate change adaptation, so as to achieve effective management of key climate risks in Montenegro, by applying a transformative adaptation strategy. Therefore, the CCAP aims not only to mitigate the consequences of climate change, but also to reduce the underlying causes of vulnerability in the long term, thus contributing to Montenegro's long-term vision of climate resilience.

The CCAP process in Montenegro started with identifying priority sectors requiring adaptation to climate change in Montenegro, and they are Agriculture, Water, Health and Tourism, in addition to a cross-cutting thematic area which included aspects around gender and inclusion. For each of these sectors a vulnerability assessment, analysis of institutional capacities, and analysis of gender aspects was conducted. Based on findings from this process, the wider vision and objectives of the CCAP and a list of relevant adaptation measures was created. Through a prioritization process, measures were selected that were determined, through a participatory process, to be the most appropriate and necessary in each of the priority sectors.

These priority measures are detailed in the portfolio, containing comprehensive specifics for each one of them, including: implementation steps, timeframe, actors responsible for implementation, cost estimates, and financing tools. This information were prepared to provide entities responsible for individual measures with a detailed guide to help them in their implementation.

To implement the priority measures from the CCAP, a financing strategy was also developed, which is based on needs assessment, analysis of available budget and international sources, and recommendations for sustainable medium- and long-term financing.

The Climate Change Adaptation Plan is structured into seven main chapters and four annexes. The legal and institutional framework, the preparation process and methodology, and the key principles that guided the preparation of the document are presented in the introductory chapters. The central part of the document includes an analysis of the current situation, including the identification of climate change impacts, risk assessment, sectoral vulnerabilities, institutional capacities, and gender aspects. A separate chapter is dedicated to the definition of the vision, strategic, and operational objectives by sector (agriculture, water, health, tourism), as well as cross-cutting measures. The document then elaborates on monitoring and evaluation mechanisms, the financial framework, and public awareness.

The annexes include a detailed Action Plan for the first two years of the implementation, a list of priority measures by sector, a set of indicators to monitor the progress, and sectoral climate vulnerability analyses.

The structure of this Plan is as follows:

- **Introduction:** Explains the basis for the development of the Plan, including Montenegro's national and international commitments, and describes the process and the key principles that guided the preparation of the document.
- **Strategic, legislative and institutional framework:**
    - Overview of international and national commitments;
    - Alignment with the key strategic documents.
- **Situation analysis:**
    - Observed and expected climate change;
    - Key vulnerabilities of the agriculture, water, health, and tourism sectors;
    - Analysis of institutional capacities and gender equality.
- **Vision and goals:**
    - Vision for Montenegro's climate change resilience;
    - Specific objectives and measures for key sectors (agriculture, water, health, tourism) and a cross-cutting approach.
- **Monitoring and Evaluation Tools (M&E):**
    - Roles and responsibilities of institutions;
    - Indicators to monitor progress in implementing measures.
- **Financial framework:**
    - Planning of funds needed for the implementation of adaptation measures, including funding sources.
- **Annexes:**
    - Detailed action plan for the first two years of the implementation.
    - Priority adaptation measures for sectors and indicators.
    - Conclusions on climate vulnerability.

Key findings of priority sectors' vulnerability analyses

Agriculture

Key Climate Vulnerabilties

Increased temperatures, causing earlier vegetation period affect bee populations, crop yields (especially for fruit) and result in increased heat stress to livestock.

Reduced rainfall, poor irrigation and the lack of water availability especially in summer months. Areas most vulnerable to drought are the coastal areas and both the Zeta and Bjelopavlici valleys.

Changes in the conditions of marine and riverine habitats affecting fisheries, in addition to the sedimentation of rivers.

Increased damage to crops from weather related events such as hail, winds and flooding.

Lack of awareness of climate issues and the relatively low adaptive capacity of farmers to respond to climate change.

Gender Considerations

Restricted involvement in agricultural production and rural development.

Exclusion from Climate Policy Planning.

Gender Disparities in National Programs.

Local Budget Limitations and Climate Resilience.

Lack of recognition of the interconnectedness between gender and climate change in civil society efforts.

Priority Agriculture Measures

A2.1.1. Raise capacities and awareness on combined production practices.
A3.1.1. Enhancing the application of climate-smart agrotechnical measures.
A3.1.2. Identifying and implementing measures to reduce climate stress on livestock.
A3.2.1. Preservation of hay meadows and pastures and the promotion of sustainable land use practices.

Figure 2.2: Water Summary Diagram

Water

Key Climate Vulnerabilties

Lack of data and inter-sectoral cooperation.

Lack of maintenance, planning and protection zones.

Summer water availability impacting key sectors.

Coastal and inland flooding and low water quality, impacting ecosystems, infrastructure, households, agriculture, and tourism.

Deforestation and agriculture impacting water quality and availability and increasing sedimentation/erosion.

Deficient water management system with low risk reduction capacities.

Local population with good knowledge on ecosystem based adaptation.

Gender Considerations

A mismatch between educational/knowledge resources of women and their presence in the water sector labor market is evident.

In the workforce the share of women in water supply, sewerage, waste management and remediation activities is 20.8% while the share of women among specialists/ masters for water quality, water use and water protection is 46%.

Priority Water Measures

W1.1.1. Strengthen the network of measuring stations and improve the monitoring of water related data.
W1.1.2. Upgrading of flood risk mapping and interventions that prioritise Natural Water Retention measures.
W2.1.1. Improve capacities of policy makers and strengthen the research and management capacities. To assess the occurrence and risk of adverse impacts of climate change and adaptation of freshwater systems.
W2.1.2. Develop new methodologies and design watershed protection zone projects at all water sources integrating climate change aspects.

Figure 2.3: Tourism summary diagram

Tourism

Key Climate Vulnerabilties

Lack of climate change data.

A lack of product diversification despite vast opportunities e.g. high dependence on coast.

Uneven seasonal and geographical distribution of tourist arrivals.

Lack of specific climate adaptation policy guidance and active/ effective sustainability framework.

Tourism sector and its infrastructure (especially coastal and mountainous) is very sensitive to climate related hazard events.

Lack of preparedness for hazard events in the sector.

Gender Considerations

The share of women working in the accommodation and restaurant business is 42.5%. However the percentage of business entities owned by women in the sector is just 9.3%.

Policy in sector is not gender sensitive.

There are various projects and initiatives aimed at assisting women in the sector, however they are currently limited.

Priority Tourism Measures

T1.1.1. Developing community-based tourism programmes as a strategy for building climate resilience e.g. promoting rural, agro and eco tourism and other high value, low impact tourism products.

T1.2.2. Providing financial and non-financial support to tourism-based communities who are vulnerable to climate change to help diversify and adapt to climate change, with sustainable tourism of fer.

T1.2.3. Improve funding opportunities to facilitate research and innovation into sustainable tourism practices and how they could be implemented more widely.

T3.1.1. Upgrade early warning systems for tourism businesses and users and implement awareness program.

Figure 2.4: Health summary diagram

Health

Key Climate Vulnerabilties

Higher temperatures increasing mortality and incidence of disease in vulnerable populations, increase in food and vector-based disease and reduced nutrition.

Poor air quality health impacts, caused by wildfires, increased energy-related pollution and higher humidity.

Increased coastal and inland flooding and poor water quality, increasing incidence of drowning, illness and mental health issues.

Insufficient number of healthcare professionals and lack of capacity on climate related risks.

Geographic–regional discrepancies in the access to healthcare.

Remote and socially deprived population groups.

Good health screening of vulnerable populations and legislation that mandates health protection for all citizens.

Gender Considerations

The Health System Adaptation Program, Health Care Act from 2021, Center for Health Promotion with the work plan of the Center for 2022, and the National Strategy for Gender Equality have progressed gender inclusive policy and action in Montenegro's Health sector.

The health sector is, along with social care and education, a profession with the highest concentration of women. With 63,62% of public physicians and 62,38% of specialist physicians being women.

Priority Health Measures

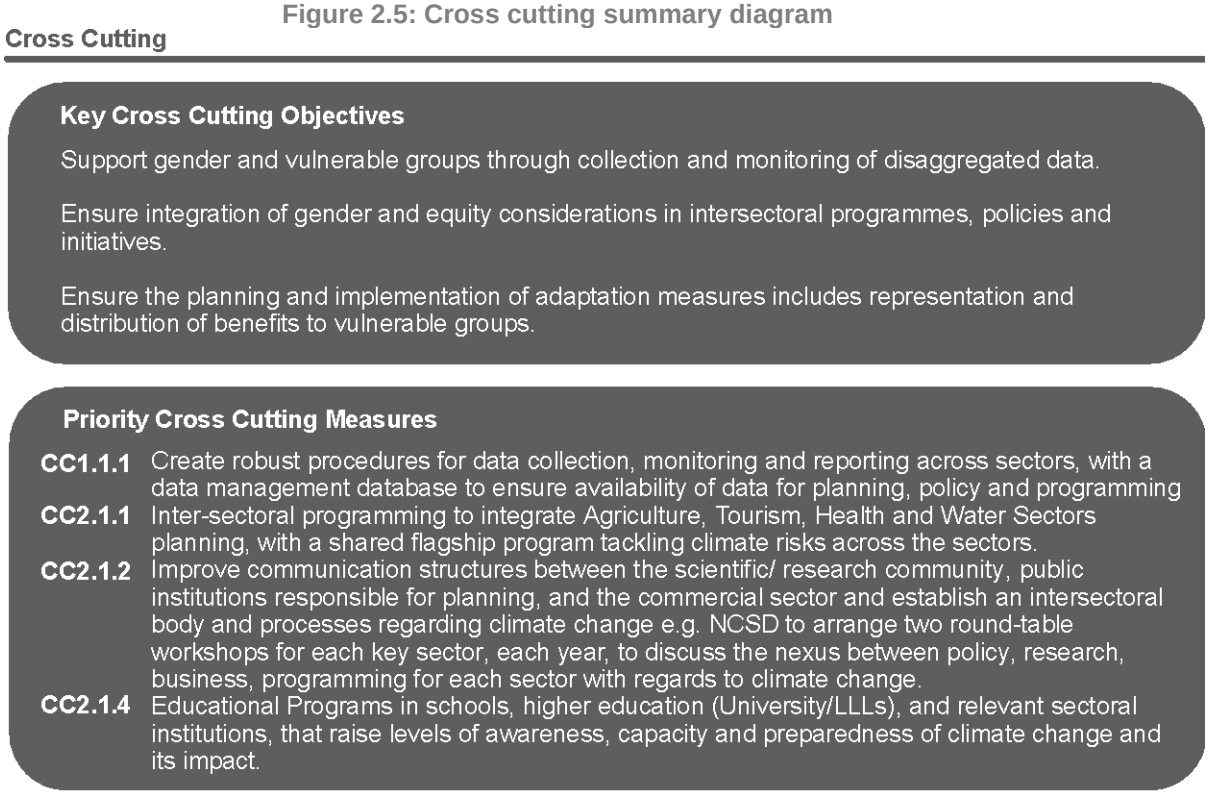
H1.1.1. Improve the preparedness of staff, facilities and systems in the health sector for climate hazards, through training, climate risk assessments and specific interventions.

H1.1.2. Include and define health sector's role in hazard preparedness and response in the national and local level readiness plans.

H1.1.3. Introduce an early warning system to prepare the health sector for appropriate response during the weather extremes, supported by training programmes to enhance knowledge and skills of the workforce in the health care facilities.

H3.1.1. Development and promotion of education, awareness raising and general guidelines and support of facilities for the population during heat waves and extremes.

Figure 2.5: Cross cutting summary diagram



More detailed information on climate vulnerability findings can be found in Appendix D.

1. Introduction

In line with its internationally and nationally accepted commitments under the United Nations (UN) Framework Convention on Climate Change (UNFCCC), as an Annex II country, followed by the Kyoto Protocol, and the Paris Agreement (ratified in 2017), as well as in accordance with Montenegro's Program of Accession to the European Union and Article 9 of the Law on Protection Against the Adverse Effects of Climate Change (Official Gazette of Montenegro 73/19), Montenegro embarked on the development of the national Climate Change Adaptation Plan (CCAP), or National Adaptation Plan (which is the globally accepted title for the document).

Over the past few years, Montenegro has adopted key strategic climate change documents, such as the National Climate Change Strategy until 2030 and the National Sustainable Development Strategy until 2030, along with several sectoral strategies containing sections on climate change. At the same time, the Low Carbon Development Strategy and the National Energy and Climate Plan (NECP) are currently being prepared, while the Disaster Risk Reduction Strategy for the period 2025–2030, with an action plan for the period 2025-2026, was adopted in November 2024. Montenegro has thus made significant progress in climate change planning and has positioned itself as a country that recognizes the importance of this issue.

However, previous planning predominantly focused on climate change mitigation measures, while the mainstreaming of climate change adaptation into all sectors and public policies remains limited. Even in cases where adaptation aspects are included into strategic or planning documents, detailed and concrete measures that could be effectively implemented are often missing. This situation indicated a clear need for the preparation of a strategic document dedicated solely to Montenegro's climate change adaptation. Such a document would make a systematic approach possible and identify specific measures to strengthen the country's resilience to climate challenges.

The Climate Change Adaptation Plan (CCAP) is conceived as a policy instrument, aimed to support the design, coordination, implementation, and monitoring of national efforts in managing climate risks. CCAP is expected connect the international agreements and knowledge with the national policy, and lay down specific measures linked to the most important climate vulnerabilities in the key sectors of agriculture, water, tourism and health. The CCAP document includes a range of measures that will build resilience and ensure enhanced capacities of Montenegro to adapt to the adverse climate change effects. This is the beginning of a continuous process which will lead to the climate resilient Montenegro, a vision which has been formulated as part of the CCAP preparation process.

The CCAP preparation process was not limited solely to the development of the document itself, but also encompassed broader activities aimed at establishing a sustainable and institutionally based planning process to prevent and mitigate the negative impacts of climate change. In response to the multiple challenges posed by climate change, Montenegro launched a strategic initiative called "Enhancing Montenegro's Capacities to Integrate Climate Change Risks into Planning" (NAP project). This initiative, approved for financing within the Green Climate Fund (GCF) capacity building program and implemented by the United Nations Development Programme (UNDP) in Montenegro, aims to strengthen Montenegro's resilience to the negative impact of climate change. Therefore, the CCAP preparation focused not only on a strategic document development, but also on establishing an adaptation planning process. The process included:

CCAP development: The process was participatory in nature and based on contributions from all relevant national institutions, individual experts, as well as on the analysis of available data.

Strengthening of the institutional coordination framework:
In accordance with the project document approved by the Green Climate Fund, one of the key elements of the process was to strengthen the institutional coordination framework in the field of climate change, and the CCAP development process to rely on the working group dealing with climate change issues under the National Council for Sustainable Development of Montenegro. The CCAP preparation process began with the support for reorganization and relaunch of the National Council for Sustainable Development, as well as the formation of three working groups relevant for the planning process in the climate change context: for climate change mitigation and adaptation, for sustainable development

financing, and for just transition. With appropriate capacity-building interventions, these working groups gave an important contribution to the overall CCAP development process.

Improvement of the legal framework: To ensure the long-term sustainability of the adaptation process, suggestions aimed at improving the proposal of the Law on Climate Change were provided, so as to define the framework for adaptation planning, establish modalities for CCAP revisions and updates, and specify the responsibilities of relevant institutional partners.

Guidelines for future CCAP revisions: The process identified a set of guidelines for: improving and creating capacity building programs, setting adaptation targets, vulnerability assessment, monitoring and evaluation, and financial planning. Once the proposal of the Climate Change Law, these guidelines will be elaborate through appropriate secondary legislation.

The outcome of this entire process is the Climate Change Adaptation Plan, along with the establishment of coordination mechanisms and clear guidelines for its revision and enhancement during its ten-year period of validity.

This process-oriented approach made it possible for the document to function as an initial iteration, which assesses capacities and capabilities for implementation of the adaptation measures and identifies key needs for their improvement.

More precise and specific identification of measures within the identified priority sectors are expected in future revisions of this Plan. Additionally, the document leaves room not only to improve existing recommendations and measures but also to include additional sectors in line with future needs and lessons learned.

1.1. CCAP development process and methodology

CCAP development is a strategic process, led by the national government, but with participation of a broad range of stakeholders, which is the key aspect of the CCAP development and through which all relevant stakeholders had a chance to contribute to the document and to the overall process.

As a strategic document adopted at the national level, the CCAP has been developed based on the "Methodology of Developing Policies, Drafting and Monitoring the Implementation of Strategic Documents" prepared by the General Secretariat of the Government (hereinafter referred to as the Methodology). Since this Methodology lists the principle of cooperation as one of key principles, the CCAP development process sought to ensure significant participation of a wide range of partners who could contribute to the quality of the document. Therefore, one of the first steps was a series of activities to re-establish and launch the National Council for Sustainable Development (hereinafter referred to as NCSD), as well as the formation of working groups within the NCSD. The working groups formed with mandates in the fields of climate change (adaptation and mitigation), financing sustainable development, and just transition, operated as NCSD groups and provided support to the CCAP development, in cooperation with the ministry responsible for climate change issues. Thus, a platform has been created that ensures the institutionalization of the preparation process, as well as creation of prerequisites for subsequent monitoring of implementation, reporting, and revision of the CCAP by multidisciplinary groups that include a wide range of stakeholders from the public sector, academia, NGO sector, and individual experts.

The CCAP development process started with identification of priority sectors In Montenegro, which require urgent implementation of climate change adaptation measures. The sectors are: agriculture, water, health and tourism, with special focus on cross-cutting area that includes gender and inclusion considerations. A detailed vulnerability assessment was carried out for each sector, as well as the analyses of gender considerations (the analyses are available as separate documents).

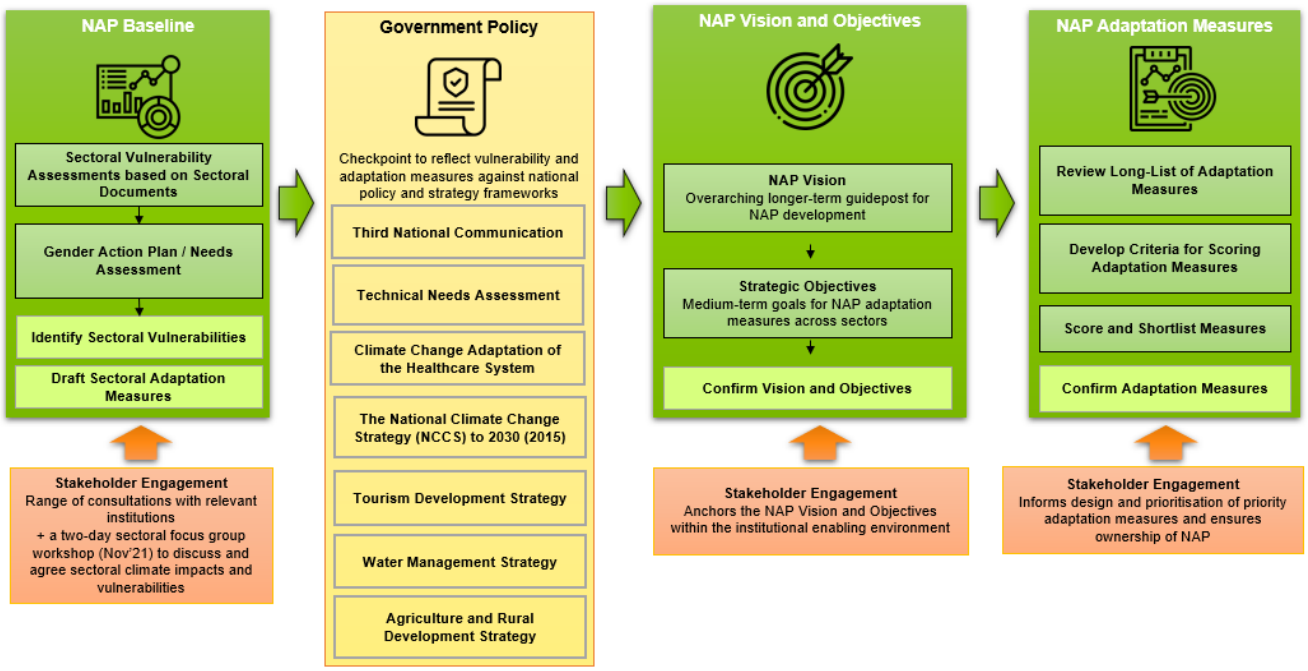
Based on the outcomes of these processes, including the vulnerability analyses of the health, agriculture, water, and tourism sectors to climate change, in addition to the broader vision and objectives of the CCAP (provided in Chapter 5), a list of specific adaptation measures has also been developed. These measures will be implemented to reduce the negative impact of climate change and enhance the country's resilience to their consequences. Key findings were derived from this (see

Chapter 4), and impact chains were also used to show the interconnection between risks and their components in each sector.

Stakeholder workshops were conducted for each sector to verify the key findings, to rationalize the list of measures, and to conduct a measure prioritization exercise. The prioritization was based on the stakeholder inputs, expert opinion and application of a multi-criteria analysis, the weightings of which were determined by the stakeholders. The measures scoring highest were selected from each sector and a cross-cutting group. Around eight measures were shortlisted for each sector, and the four highest scoring for each sector and cross-cutting sector were selected as high priority measures, and therefore a focus for the short term. These prioritized measures were then verified with the stakeholders from the NCSD Working Group for climate change mitigation and adaptation, before these high priority measures, detailed in Chapter 5, were developed and elaborated on further.

The process is detailed in Figure 1.1

Figure 1.1 CCAP development process (part 1)



Stakeholders who participated in shortlisting high priority measures included representatives of the Statistical Office of Montenegro - MONSTAT, National Tourist Organization, Investment Development Fund, (former) Ministry of Economic Development and Tourism, National Parks of Montenegro, Institute for Public Health, Environmental Protection Agency, Ministry of Agriculture, Forestry and Water Management, academia, Institute for Hydrometeorology and Seismology, Water Administration and independent national consultants. These stakeholders included 19 people in total, of whom five were men (26.3%) and 14 were women (73.7%).

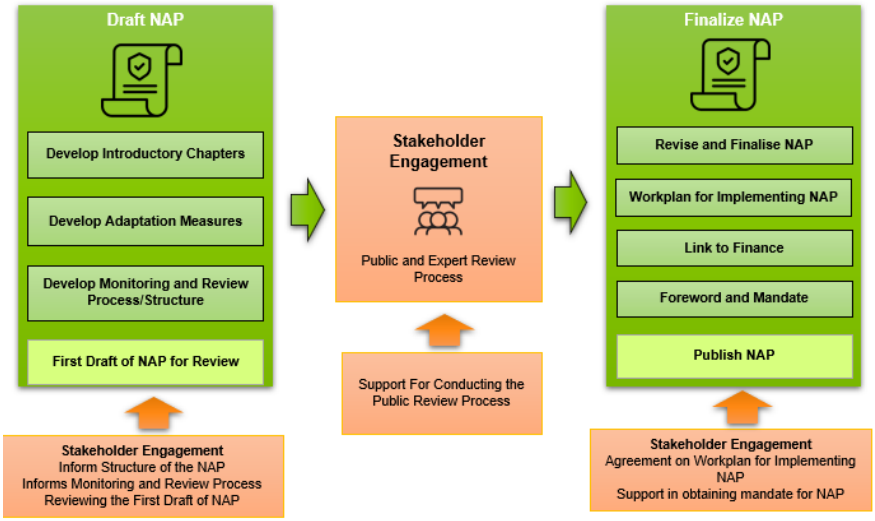
Once the high priority measures were drafted, they were then reviewed by a range of stakeholder groups including representatives of Public Company for Coastal Zone Management of Montenegro, Ministry of Human and Minority Rights, Ministry of Agriculture, Forestry and Water Management, Environmental Protection Agency, General Secretariat of the Government of Montenegro (Department for strategic planning and coordination of the Government's policies and the Office for Sustainable Development), academia, (former) Ministry of Science and Technological Development, Ministry of Health, Innovation Fund and independent consultants. Regarding this stakeholder group, it included 20 people - seven men (35%) and 13 women (65%).

Progress in developing the CCAP was periodically presented to the NCSD's Working Group for Climate Change Adaptation and Mitigation to Climate Change, as well as to the Working Group for Sustainable Financing, so as to ensure continuous information flow and obtain necessary information.

Subsequently, a public consultation process was conducted to discuss the draft CCAP, which included individual meetings, public debates, and feedback from sectoral experts. The public consultation process was organized in June and July 2024.

This process is illustrated in figure 1.2.

Figure 1.2 CCAP development process (part 2)



1.2. CCAP assumptions and principles

The key principles that guided the preparation of the document are: the principle of compliance, the principle of financial sustainability, the principle of responsibility, the principle of cooperation, the principle of transparency, the principle of continuity, and the principle of efficiency and rational planning. The process of Montenegro's CCAP preparation specifically relied on:

- Transformative Adaptation
- Just Resilience
- Participatory and pragmatic approach
- Planning

The first principle centres around bringing about **transformational adaptation**, which essentially is a strategy to reduce the root causes of vulnerability to climate change, this is to be achieved by ***"****shifting systems away from unsustainable or undesirable trajectories*".[1] So whilst *'no regrets'* and *'win-win'* adaptation measures will be identified, the measures which seek to bring about longer-term transformative adaptation will also be sought after. A pragmatic approach has been taken to ensure that a combination of short-term easier to implement measures have been integrated to support longer-term more transformative measures.

The EEA's "Overview of Knowledge and Practice for Just Resilience" report and the EU Adaptation Strategy introduce the notion of **'just resilience**', which will be a core pillar of the CCAP. They underline that "*achieving resilience in a just and fair way is essential so that the benefits of climate adaptation are widely and equitably shared*". The Adaptation Strategy furthermore stresses the importance of understanding the nexus between climate hazards and socio-economic vulnerability.

[1] Giacomo Fedele, Camila I. Donatti, Celia A. Harvey, Lee Hannah, David G. Hole. 2019. Transformative adaptation to climate change for sustainable social-ecological systems, Environmental Science & Policy,

The mission of adaptation to climate change sets out a vision for a climate-resilient Europe that is built on a principle of a *"resilience of social and economic systems with a commitment to equity, social justice and to leave no one behind"*. It highlights the need for inclusive and deliberative governance processes towards fair transitions and the need to address underlying drivers of inequality and poverty. At the international level under the Paris Agreement, parties, including the European countries, are to *"respect, promote and consider their respective obligations on human rights the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity"* when taking climate action. Countries are also asked to submit and regularly update adaptation communications, which inter alia are to address the social aspects.[2]

Through a **proper planning** process, policymakers and stakeholders can assess past adaptation efforts, identify strengths, weaknesses, and lessons learned. This retrospective analysis helps to refine future adaptation strategies, enabling the CCAP to evolve and stay relevant amidst a changing climate landscape. By adopting a pragmatic approach, the CCAP is designed to be achievable, building on existing baseline measures, and avoiding redundant efforts. This method fosters efficiency and effectiveness, utilizing available resources and expertise optimally.

The CCAP embraces a forward-looking, **participatory** and **pragmatic** approach, laying the foundation for a resilient and climate-resilient Montenegro that leaves no one behind. CCAP development was participatory, gender responsive and inclusive and carried out in a transparent manner. The process was country driven, incorporated both top-down and bottom-up approaches and promoted horizontal and vertical integration. It was based on the multi- and interdisciplinary approach, drawing data and information from published scientific and grey literature, local and expert knowledge as well as from the lessons learned from previous processes, while respecting the legal requirements and national and international guidelines.

[2] Adaptation Communication to UNFCCC, https://unfccc.int/topics/adaptation-and-resilience/workstreams/adaptation communications

2. Strategic, legislative, institutional framework and strategic compliance

2.1 Strategic and legislative framework

After restoring its independence, Montenegro focused on consolidating international treaties inherited from former Yugoslavia and the State Union of Serbia and Montenegro. The country followed international law principles regarding treaty succession. Montenegro has become a party to several international conventions related to climate change adaptation:

- Montenegro joined the UN Framework Convention on Climate Change (UNFCCC) as a non-Annex-I Party (October 2006);
- Montenegro became a party to the Kyoto Protocol to the UNFCCC (June 2007);
- Montenegro ratified the Paris Agreement to the UNFCCC (December 2017).

In line with the Katowice Climate Package ("Katowice Rulebook") adopted at COP24 in 2018, Montenegro is actively participating in efforts to strengthen climate adaptation measures. The Nationally Determined Contributions (NDCs), which require parties to submit updated reports every five years, describing their national climate goals and activities, was one of the key parts of the Katowice Rulebook. Montenegro has already adopted and presented its updated NDC (NDC 3.0) in 2025.

Montenegro also regularly submits national communications and biennial-update reports. These reports provide information on the country's mitigation and adaptation measures, actions taken to address climate change impacts, and any relevant information in line with the objectives of the Convention. The Third National Communication was published in 2020, while the Fourth National Communication and the First Transparency report (FTR) were adopted by the Government in 2025. This CCAP document has integrated these elements into the vision, objectives and adaptation measures.

2.2. CCAP’s compliance with the national and sectoral legal framework

The legal framework of the CCAP is determined by the Law on the Protection Against Adverse Effects of Climate Change, and the methodological Decree on the Method and Procedure of Drafting, Harmonizing and Monitoring the Implementation of Strategic Documents, respecting the guidelines from the Methodology of Developing Policies, Drafting and Monitoring the Implementation of Strategic Documents. The methodology governs the method and procedure of drafting all strategic documents in Montenegro, and defines the legislative and institutional framework of the strategic planning system in Montenegro, the principles on which strategic documents are based, the steps in the process of drafting and the content of strategic documents.

Article 1 paragraph 2 of the **Constitution of Montenegro** stipulates that Montenegro is a civil, democratic, ecological and social justice state, based on the rule of law. Article 23 paragraph 3 of the Constitution stipulates that everyone, especially the state, is obliged to protect and improve the environment.

Article 13 of the **Law on State Administration** prescribes that the proposal of internal and external policy includes the development of strategies and programs based on the monitoring of the implementation of laws and other regulations and the observation and analysis of the situation in a certain area, with the aim of harmonizing the legal system with modern, democratic and internationally recognized standards.

The same article also stipulates that strategies and programs must be mutually coordinated and aligned with planning and strategic documents that determine the general directions of development at the level of Montenegro, and particularly with financial strategic documents.

2.3. CCAP’s compliance with the national and sectoral strategic framework

The strategic planning system in Montenegro includes strategic documents that determine the key directions of public policy action at the national level, define the priorities and development policy of the state, and undertake the international obligations of Montenegro arising from membership in international organizations, as well as the process of Montenegro's accession to the European Union, which significantly determines the strategic planning of policies. The Climate Change Adaptation Plan is, as a sectoral document, linked to other key strategic documents and other sectoral documents, which is in the subsection below, 2.3.1. Plan's compliance.

2.3.1. CCAP's compliance with the overarching strategic documents

The National Strategy for Sustainable Development until 2030

The National Strategy for Sustainable Development until 2030 represents the long-term development strategy of Montenegro, focusing on sustainable management of four groups of national resources: human, social, natural and economic. These resources define priorities for the overall development of Montenegrin society. By objectively and comprehensively analysing the sustainability of national development, Montenegro has become one of the first countries in the world to fully accept and integrate the United Nations requirements from the 2030 Agenda for Sustainable Development into its national system. Considering the impact of climate change, the variability of climate change, extreme events and their projections, the strategy establishes that "the priority is the implementation of measures for adaptation to climate change in the sectors of water resources, public health and agriculture (agricultural land, agricultural production)." The implementation of strategic goals and activities within operational objectives directly contributes to the implementation of priority measures from the NSDS 2030, and primarily measure 4.4.1. Climate change mitigation, but also contributes to measures 4.1.2. Improving the health of citizens of all ages and reducing health inequalities, 4.2.1. Active relationship of key stakeholders towards sustainable development, 4.3.1. Stopping the degradation of values of renewable natural resources, 4.3.2. Efficient management of renewable natural resources, 4.3.3. The state of the environment and human health improvement.

National Climate Change Strategy until 2030

The National Climate Change Strategy until 2030 is a framework strategic document for climate policy in Montenegro. It is inherently closely linked to numerous other sectoral strategies as well as other documents in the field of climate change. The CCAP is fully aligned with the National Climate Change Strategy until 2030. CCAP's Chapter 6, namely, addresses adaptation to climate change, as well as Chapter 8 - Implementation Roadmap (Action Plan). In line with the recommendations from the United Nations Framework Convention on Climate Change and the provisions of the Decision on the EU Monitoring Mechanism and Regulation (EU) 2018/1999, the strategy recommends the development of a National Adaptation Plan. That chapter of the strategy includes detailed instructions for developing the adaptation plan in accordance with relevant UN and EU documents, and these guidelines have been fully applied to the development of the CCAP. The adoption of the CCAP marks the completion of measure 11, the development of a national climate change adaptation plan.

The Med-term Work Program of the Government 2024-2027

The document is fully harmonized with the Mid-Term Work Programme of the Government of Montenegro for the period 2024–2027. Its basic principles originate from the previous document, the National Climate Change Strategy until 2030, which included an analysis of the achieved effects of previous public policy in this field. Based on monitoring, previous reporting, relevant recommendations, and evaluation, activities from the previous document that were not completed were identified and added to the new document. The Work Program contributes horizontally to a large number of thematic areas. Thematic area 1, 3. Natural Resources – preservation of natural capital, and strategic objectives 1.2, 3.1, 3.2, 3.3 are worth noting.

Fiscal Strategy for the period 2021–2024

Starting from the identified challenges in reducing the negative impact of climate change that Montenegro faces on its path to social and economic development, and in line with one of the foundational principles of the Government's work – health and a healthy environment – the main goal of Montenegro's economic policy is "to achieve smart, sustainable, and inclusive economic growth that will contribute to the improvement of the quality of life for all its citizens." The implementation of activities aimed at reduci the adverse effects of climate change will be financed from the budget of Montenegro, the budgets of local self-government units, funds from the Protection and Rescue Fund, loans, the through programs and projects funded by EU and other international organizations, as well as from other sources. The Government of Montenegro will allocate a budget for each year of the plan's implementation from its own sources and/or from appropriate international community funds. The total amount of funds to be allocated from the national budget in the coming years to finance the plan will depend on the funds planned for these purposes in the annual budget laws of the key implementers of the activities identified by the plan.

Development Directions of Montenegro 2018-2021 in chapter 4 – Environment highlights as one of the measures the need to develop a Climate Change Adaptation Plan in order to identify the medium- and long-term needs of climate change adaptation and establish a system for coordinating the implementation of climate change adaptation measures.

2.3.2. Plan's compliance with other sectoral strategic documents relevant for this public policy subject area

The Spatial Plan of Montenegro until 2020, as the most important document for the planning of the spatial development of Montenegro, in the section on the general principles of spatial development, defines as a general goal the harmonization of spatial development with spatial limitations, above all the direction of spatial development in accordance with high risks from natural and other disasters (earthquakes, floods, erosion, fires, accidents, etc.), as well as the risks of the possible negative impact of natural disasters, primarily due to the consequences of climate change. Also, **the Draft Spatial Plan of Montenegro until 2040**, as part of the analysis of the current state of organization, arrangement and use of space, indicates the endangerment of biodiversity, loss and degradation of habitat due to urbanization, the construction of transport and energy infrastructure, excessive use of forests and various forms of pollution as well as climate changes.

The National Security Strategy in chapter 5 - Security challenges, risks and threats - defines that the lack of natural resources and the degradation of the environment are the result of climate change, large emissions of harmful gases, uncontrolled and improper use of natural resources. Climate change, as one of the biggest problems of today, results in intense and frequent occurrences of large and catastrophic fires, garbage, floods, extreme meteorological phenomena, earthquakes and other natural disasters, which threaten the lives and health of people, adversely affect the environment and pose a danger to survival of many plant and animal species, as well as cultural heritage.

Regional Development Strategy of Montenegro 2023-2027 as operational goal 3.5. envisages environmental protection, development of the energy sector, improvement of energy efficiency, adaptation and mitigation of the effects of climate change.

The Healthcare Development Strategy 2023-2027 recognizes the impact of climate change and in the Action Plan for the period 2023-2024 foresees the preparation of a comprehensive analysis of healthcare needs in Montenegro with a plan for the development of human resources in healthcare and service providers by level of healthcare, taking into account the impact of climate change. In addition, the Healthcare Development Strategy 2023-2027 emphasizes primary healthcare, which means strengthening the prevention and prevention measures as the basis for citizens' readiness for emerging changes.
The Strategy foresees the following through its objectives:
Strategic Goal 1: Establish a new model of healthcare provision that promotes quality healthcare with the citizen at the centre, focusing on primary healthcare. Strategic
Goal 2: Effective health promotion and disease prevention through risk factor control, improvement of multi-sectoral cooperation, and involvement of the entire society.
Strategic Goal 3: Strengthened capacity for the health system's preparedness and response to health emergencies.

The Tourism Development Strategy (2022-2025) recognizes climate change as one of the risks in the SWOT analysis. In chapter 11 - Contemporary directions of tourism development, it is emphasized that the implementation of urgent climate actions in tourism is of particular importance for creating the necessary conditions for greater resilience of this sector. Climate action is reflected in efforts to measure and reduce GHG (greenhouse gases) emissions and strengthen the capacity to adapt to climate impacts. The strategy points out that competent institutions for climate change are establishing a legal and strategic framework in response to international obligations on this issue, and tourism is being considered in several areas. In addition to the above, policy making in the areas of national parks, health and safety, infrastructure development, agriculture, land use planning, with an emphasis on defining expected risks in relation to tourist destinations, the role of stakeholders and adaptation measures, is of special importance for climate change.

Montenegro's Water Management Strategy in chapter 6 - Objectives and strategic determinants of implementation of water management of Montenegro recognizes the role of adapting to climate change, emphasizing that water protection is only one of the areas in which the impact of global climate change is manifested. Changes in the distribution pattern, duration and intensity of precipitation and dry periods indicate changes in the water balance. According to the data so far, the annual precipitation totals have not changed to a greater extent, but their extremes have become more pronounced and more frequent. Therefore, the impact of climate change must not be ignored or interpreted as unimportant. As a result of global climate changes, along with the impact of some human activities on rivers (regulations, water abstraction for various purposes, etc.), worsening of extreme hydrological events can be expected, i.e. high water levels during floods will increase, and periods of low water will be prolonged. These phenomena require increased application of active protection measures (accumulations, retention, reconstruction of channel protection systems in valleys), as well as consistent application of non-investment protection measures in order to stop the trend of increasing potential damages. In spatial plans, all locations planned for the construction of reservoirs in the frontal parts of the basin must be preserved, as well as the areas of planned retentions for mitigating flood waves in extreme hydrological situations. The strategy establishes operational goals and measures to achieve these goals.

The Strategy for the Development of Agriculture and Rural Areas (2023-2028) recognizes that agriculture is one of the sectors most affected by climate change, as agricultural products directly depend on climate factors. Agriculture faces the great challenge of adapting to the expected effects of climate change. Montenegro belongs to one of the regions in the world in which pronounced negative impacts of climate change on population health, economic development and availability of natural resources, food production, etc. are expected, despite the fact that, as a developing country, it does not have a significant share in global atmospheric pollution greenhouse gases. On the contrary, due to the relatively high proportion of forest and vegetation areas, it contributes to the stabilization of the level of carbon dioxide in the atmosphere. The effects of climate change can negatively affect soil fertility by reducing soil organic matter and increasing the risk of soil erosion due to higher temperatures and more frequent droughts and rainfall. Montenegro is particularly exposed and sensitive to climatic hazards such as droughts, floods, forest fires and heat waves.

The Disaster Risk Reduction Strategy for the period 2025–2030 with the Action Plan for the period 2025–2026 aims to reduce and prevent new risks, and strengthen the capacities of the society and state institutions in responding to various types of natural and other disasters. Montenegro's Disaster Risk Reduction Strategy was prepared in accordance with the Sendai Framework, the Paris Agreement, the Sustainable Development Goals, and EU targets regarding disaster resilience, as well as the principle of gender equality with a special focus on vulnerable groups. This Strategy represents a continuation of Montenegro's efforts to improve disaster risk reduction and simultaneously serves as a roadmap to be implemented over the next five years through the operationalization of strategic into operational objectives with accompanying measures and activities in various sectors at the national/local level. The strategic objectives are aligned with the global priorities of the Sendai Framework and include: understanding disaster risks, strengthening disaster risk governance to better manage disaster risks, investing in disaster risk reduction to strengthen community resilience, and enhancing preparedness for effective disaster response to "build back better" in the process of recovery, remediation, and reconstruction. The Strategy uses an integrated approach in the fields of disaster risk reduction, climate change, and sustainable development goals. During the parallel process of development of the CCAP and this strategy, effective coordination and mutual alignment of these two strategic documents were ensured.

2.3.3. An overview of Montenegro’s commitments in the field of climate change impact reduction

The UN Agenda 2030 defines 17 Sustainable Development Goals, with all the tasks and target values of the UN indicators, which will be taken into the national context by adopting the Sustainable Development Strategy of Montenegro until 2030. Within the goal 2.4. of the UN Agenda it is foreseen to ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality. In addition, under goal 13.2 it is defined to integrate climate change measures into national policies, strategies and planning in terms of number of countries with nationally determined contributions, long-term strategies, national adaptation plans, strategies as reported in adaptation communications and national communications.

In 2017, Montenegro ratified the **Paris Agreement** under the United Nations Framework Convention on Climate Change by adopting the Law on Ratification of the agreement. Article 7 of this agreement defines that parties establish the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal to limit the temperature increase to 1.5°C above pre-industrial levels. The agreement also provides that each party, as necessary, engages in the processes of planning adaptation and implementation of actions, including the development or improvement of relevant plans, policies and/or contributions, which may include: (a) the implementation of adaptation actions, undertakings and/or efforts; (b) the process to formulate and implement national adaptation plans; (c) the assessment of climate change impacts and vulnerability, with a view to formulating nationally determined prioritized actions, taking into account vulnerable people, places and ecosystems; (d) monitoring and evaluating and learning from adaptation plans, policies, programs and actions; and (e) building the resilience of socioeconomic and ecological systems, including through economic diversification and sustainable management of natural resources.

The SENDAI Framework for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction (2015-2030) has a significant connection with Montenegro's CCAP through shared goals to strengthen resilience to climate risks and extreme weather events. The Sendai Framework highlights the need for a multi-sectoral approach to risk reduction, including improvement of institutional capacities, coordination between sectors, and better integration of climate change risks into national strategies. Montenegro's CCAP recognizes the Sendai Framework as one of the key international documents shaping the approach to climate change adaptation, especially with regard to the reduction of vulnerability of sectors such as health, agriculture, tourism, and water.

In addition, data from the Sendai Framework, implemented through the DesInventar software, are used to monitor and quantify risks, including reducing loss of life, livelihoods, and economic damage, which is consistent with the CCAP's goals to strengthen resilience and sustainable development. Therefore, the Sendai Framework integration into national strategies, including the CCAP, helps align disaster risk reduction and climate change adaptation policies through joint planning and actions.

Objectives of EU policy on climate change

The European Union is committed to the fight against climate change, both internationally and within the Union, as evidenced by the fact that this issue is among the priorities on the EU's political agenda. The European Green Deal sets out the Commission's commitment to tackling climate and environmental challenges and introduces the Green Pledge to 'do no harm'. It is essential as a road map and growth strategy towards a prosperous, resilient and healthy future, which has become even more necessary in light of the very serious effects of the COVID-19 pandemic on health and economic well-being. The new, more ambitious Adaptation Strategy was announced in the Communication on the European Green Deal, and then as part of the Commission's Work Program for 2021.

In 2021, the European Commission adopted its new strategy on adaptation to climate change. The new strategy identifies measures on how the European Union can adapt to the inevitable impacts of climate change and become climate resilient by 2050. The overall goal of the Strategy is to contribute to a more climate-resilient Europe by increasing the readiness and capacity to respond to the impacts of climate change at the local, regional, national and EU levels, developing a coherent approach and improving coordination. The strategy has four main goals: to make adaptation smarter, faster and more systemic and to strengthen international action in adapting to climate change.

Table 2.1 Key public policies relevant for climate change adaptation in Montenegro

Policy	No.	Description
The Environment Law	Official Gazette of Montenegro no. 52/16, 73/19	Montenegro's umbrella environment law. It lays down the principles of environmental protection and sustainable development, entities, environmental protection tools and measures, access to information, public participation, access to justice in environmental matters, environmental financing and other matters relevant for the environment. In addition to this law, there is a large number of other laws and implementing acts governing specific environmental matters. This law made the establishment of the Environmental Protection Fund possible, which was done with a special Government Decision (OGM no. 81/18 and 5/20). In addition, numerous normative acts have been enacted in the field of environmental protection.
The Law on Environment Impact Assessment	Official Gazette of Montenegro no. 75/18	This law prescribes procedures for carrying out an EIA study for projects that may have significant impacts on the environment, contents of the EIA study, participation of interested organizations and of the public, procedures for evaluating EIA studies and issuing approvals, notification of other states on projects with potential transboundary effects, supervision and other relevant issues. This law stipulates the obligation of informing the competent Ministry of Ecology, Sustainable Development and Northern Region Development and its competent unit – the Environmental Protection Agency about the planned implementation of the project, whereby this body decides on the need to carry out an Environmental Impact Assessment (EIA) for the project. In the case it is determined that an EIA is required, the investor must prepare the study, submit it to EPA, which is followed by an official public consultation, after which the authorities take into account all the comments received from the public and approve or reject the study.
The Law on Protection Against the Negative Effects of Climate Change	Official Gazette of Montenegro no. 73/19	Governs protection against negative effects of climate change, reduction of greenhouse gas emissions, protection of the ozone layer and other matters related to climate change. It introduces the obligation to prepare the Low Carbon Development Strategy, the National Climate Change Adaptation Plan, greenhouse gas emission inventories, to obtain special permits for emissions from industrial installations, monitor, report and verify greenhouse gas emissions by aircraft operators and industrial and energy installations, as well as to issue permits for activities that deplete the ozone layer. To align the national legislation with the new EU climate legislation and ensure fulfilment of obligations under the Paris Agreement and within the Energy Community (EnC), the law is currently being amended. The enhanced Law on Climate Change will be adopted instead.
The Law on Protection and Rescue	Official Gazette of Montenegro no. 13/07, 32/11, 54/16, 146/21 and 3/23	The Law on Protection and Rescue governs the system of protecting and rescuing people, material goods, and the environment from various hazards, including natural disasters, technical and technological and other accidents. The law defines the responsibilities and obligations of national authorities, local self-government units, business organizations, entrepreneurs, and citizens in implementing protection and rescue measures. The law provides a comprehensive framework for the organization and implementation of protection and rescue activities in Montenegro, defines the roles and responsibilities of all relevant entities with the aim of providing efficient response to various types of hazards and accidents.
Water Law, including the relevant by laws	Official Gazette of Montenegro no. 27/2007, 32/2011, 47/2011 48/2015 52/2016, 55/16, 02/17, 80/17, 84/2018	The law governs the legal status and integrated water, coastal land and water facilities management, conditions and methods of water activity, with the aim to protect and ensure sustainable use of water resources in Montenegro. Waters are defined as a natural resource and a public good of general interest that is state-owned, and their use is possible only under conditions prescribed by the law. The Water Law applies to surface, ground, mineral, thermal, and coastal waters, except when used for obtaining mineral raw materials or geothermal energy. Water management includes the protection of aquatic ecosystems, pollution prevention, preservation of water quality and quantity, protection from harmful impact of waters, as well as provision of conditions for

		economic and social development. The law prescribes the obligations to develop strategic documents such as a water management strategy and water management plans by river basins, as well as public participation in the decision-making process. It also defines the competencies of national and local authorities depending on the significance of specific waters, and governs the use of water resources for water supply, irrigation, navigation, environmental protection, and other purposes of public interest. The law prescribes the development of Water Management Plans for the Danube River Basin and the Adriatic Sea Basin water areas, and Flood Risk Management Plans for the Danube River Basin and the Adriatic Sea Basin water areas in the field of protection from harmful effects of waters, as well as general and operational plans for protection from harmful effects of waters. The water management competences, including protection from the harmful effects of waters, are divided in line with the Water Law between the Water Administration and local self-government units. Funds are provided in accordance with the Law on Financing Water Management. Relevant secondary legislation arising from the law: Rulebook on the method and deadlines for determining the status of surface waters (Official Gazette of Montenegro, No. 025/19); Regulation on the method of categorization and categories of water facilities and their management and maintenance (Official Gazette of Montenegro, No. 15/08); Rulebook on the method and deadlines for determining the status of ground waters (Official Gazette of Montenegro, No. 52/19); Rulebook on the method and deadlines for implementing measures to ensure the conservation, protection and improvement of bathing water quality (Official Gazette of Montenegro, No. 28/19); Rulebook on the method and conditions for measuring the quantity of wastewater discharged into the receiver (Official Gazette of Montenegro, No. 24/10). General plan for the protection against harmful effects of water for waters of importance for Montenegro for the period 2023-2028 (Official Gazette of Montenegro no. 12/2023); Decision on the designation of areas significantly endangered by floods (Official Gazette of Montenegro no. 30/22); Rulebook on the detailed content of preliminary flood risk assessment and flood risk management plan (Official Gazette of Montenegro no. 69/15); and Rulebook on the content of operational instructions for reservoir management for flood protection (Official Gazette of Montenegro no. 3/18).
Law on Municipal Wastewater Management	Official Gazette of Montenegro no. 002/17 of 10 January 2017	The Law on Municipal Wastewater Management aims to govern the collection, treatment, and discharge of municipal wastewater in accordance with environmental standards and environmental protection. Its purpose is to establish clear requirements for the functioning of collector systems and treatment plants, to ensure that municipal wastewater does not spoil the quality of natural recipients (rivers, lakes, seas, and groundwater). The law defines types of wastewaters, including household, industrial, and atmospheric wastewater, and prescribes treatment standards (primary, secondary, tertiary, and advanced treatment). It also stipulates the obligation of local self-governments to construct and maintain wastewater treatment systems depending on the size of agglomerations. Additionally, the law recognizes industrial sectors that have to meet specific treatment requirements before discharging their wastewater into sewerage systems. Monitoring, record-keeping, and reporting on wastewater discharge have been introduced, and supervision over the implementation of regulations is carried out by competent inspection and municipal services. The Law also prescribes punitive measures for natural and legal persons who do not comply with obligations related to communal wastewater management, as well as deadlines for the implementation of infrastructure projects in this field. Its implementation is of crucial importance for the protection of water resources and public health, as well as for harmonization with international environmental standards.
Law on Water Management Financing	Official Gazette of Montenegro no. 065/28, 074/10, 040/11 and 082/20	This law defines sources of water management financing, the method of calculation and payment of fees for protection and use of water and water resources, as well as other relevant matters related to the provision and use of these resources. The law is based on the principle “user pays – polluter pays”. Financial resources which are allocated by the Government of Montenegro, the relevant Ministry and Water Directorate are collected in the form of fees/charges, paid by natural and legal entities who use the waters. There are four different grounds based on which natural and legal entities pay fees/charges: water fee;

		fee for the obtained water rights; fee from leasing public water good and water facilities and systems; donations and other sources in accordance with the law. Water fee is relevant for this project since it includes water use fee, fee for protection of water against pollution and fee for excavation of materials from the aquifer (Article 5 of the law). This article represents the basis for the Power Generation Company of Montenegro (EPCG) to pay annual fees into the national budget, which should later be spent for water management and watercourse protection activities.
The Law on Spatial Planing and Construction of Buildings	Official Gazette of Montenegro no. 064/17, 044/18, 063/18, 11/2019 and 82/2020	The Law governs the system of spatial planning, methods and requirements for construction of buildings, as well as other matters of importance. Chapter 3 prescribes requirements for construction of buildings. Additionally, it defines requirements and obligations of the employer (investor), designer, contractor and construction supervisors, as main participants in construction. The law stipulates the obligation to announce a public tender for companies that wish to participate in design and construction of buildings, while all project activities must be carried out in the way that protects the public interest.
The Healthcare Law	Official Gazette of Montenegro no. 3/2016, 39/2016, 2/2017, 44/2018, 24/2019 – other law, 24/2019 - drugi zakon, 82/2020 and8/2021	Article 6 of the Law emphasizes that citizens have the right to information necessary to preserve health and form healthy lifestyle habits, as well as to information about harmful environmental and work-related factors that can have negative health consequences. Citizens have the right to be informed about the protection of their health in the event of epidemics and other major disasters and accidents.
The Law on Tourism and Hospitality	Official Gazette of Montenegro no. 002/18 of 10 January 2018, 004/18 of 26 January 2018 i 013/18 od 28 February 2018	The purpose of the Law on Tourism and Hospitality is to govern the conditions for conducting tourism and hospitality activities in Montenegro. The aim of the law is to ensure sustainable tourism development, harmonization of economic growth with environmental protection, improvement of the quality of tourism services, and protection of the rights of tourists and service providers. Furthermore, the Law sets standards for the operation of travel agencies, guides, hospitality establishments, and other entities in tourism, with particular attention to climate change adaptation and digitalization of the sector. Additionally, the law mentions climate change and adaptation to it. Specifically, in Article 3, which addresses the principles of conducting tourism and hospitality activities, the law highlights that sustainable tourism development should be based on the balance between economic development and environmental protection, with climate change adaptation through continuous mitigation of its negative consequences. Also, Article 4 defines sustainable tourism development as a concept that includes the implementation of policies and measures to mitigate climate change, reduce greenhouse gas emissions, and transition to a low-carbon economy. Therefore, the law recognizes the importance of climate change and the need for its mitigation in the context of tourism development.

Source: *Adapted from* 'Petar Raičević, Gordana Djurović, Mirjana Ivanov and Biljana Gligorić. 2022. Gender-sensitive Climate Risk Assessment of Kotor Bay, Montenegro. GEF MedProgramme – Enhancing Environmental Security SCCF Project'

2.3.4. The Plan's compliance with the commitments arising from EU accession negotiations and main EU sectoral policies in the subject field

Montenegro's Program of EU Accession 2024 – 2027

The document is aligned with Montenegro's Programme of Accession to the European Union 2024–2027, as a strategic document defining key steps, priorities, and activities that Montenegro plans to implement within the European Union integration process during the specified period. The Programme includes commitments arising from the negotiation process, including the alignment of national legislation with the EU *acquis communautaire*, the implementation of reforms in key areas such as the rule of law, economic governance, environmental protection, and other sectors relevant for EU membership, and foresees the adoption of the National Adaptation Plan in section E) Climate Change as one of the activities for 2024.

The Action Plan for fulfilling the final benchmarks under Chapter 27 - Environment and Climate Change, defines in point 10.11. the obligations taken over from the Green Agenda for the Western Balkans/European Green Deal in the field of climate change and foresees the alignment of strategic

documents with modified climate targets and the new EU Strategy on Climate Change Adaptation and the European Climate Pact.

Table 2.2 Relevant directives applicable to CCAP

No.	Directive	Area
1	Water Framework Directive 2000/60/EC	Water policy
2	Directive 91/271/EEC	Urban waste water treatment
3	Directive 2008/105/EC	Environmental quality standards in the field of water policy
4	Directive 91/676/EEC	Protection of waters against pollution caused by nitrates from agricultural sources
5	Waste Framework Directive 2006/12/EC	Waste management
6	Directive 98/83/EC	Drinking water quality
7	Directive 2006/7/EC	Swimming water quality
8	Directive 2006/118/EZ	Groundwater protection against pollution and quality impairment
9	Directive on Flood Risk Assessment and Management 2007/60/EC	Flood management
10	Directive 2011/92/EU	Environmental Impact Assessment
11	Directive 2003/4/EC	Access to environmental information

3. Situation analysis

The CCAP preparation methodology is based on a comprehensive and interdisciplinary approach, which includes assessment of climate risks, analysis of the vulnerability of key sectors, consultations with stakeholders, and a participatory decision-making process.

The process began with the preparation of gender-sensitive climate change risk assessments, which focused on identifying information gaps and defining priority activities to reduce vulnerability. Expert vulnerability assessment included a qualitative evaluation of adaptive capacities and consultations with stakeholders. Finally, vulnerabilities and potential impacts were mapped, and priority measures addressing climate vulnerabilities and gender-disaggregated impacts were defined. Special emphasis was placed on gender-differentiated impacts in the agriculture, water, health, and tourism sectors.

The methodology for assessing the climate vulnerability of the agriculture is based on the analysis of the reference period (1971–2000 or 1991–2020 alternatively), assessment of changes in climate indicators for future periods (2011–2041 and 2041–2070), and evaluation of exposure and sensitivity based on changes in biophysical indicators. The Aqua Crop model was used for the analysis to compare yields in the baseline and climate-changed periods for crops such as maize and wheat, taking into account their different photosynthetic pathways (C4 and C3).

The methodology for assessing the climate vulnerability of the tourism sector was based on references from IPCC AR5 and AR6, covering the basis of vulnerability and resilience through an analysis of international, regional, national, and academic reports, along with an expert assessment of the tourism sector's adaptive capacities. The assessment of tourism sector resilience was carried out according to activity types (inland, aquatic, cultural-experiential), taking into account indicators of tourist thermal comfort and the sensitivity of sub-sectors to climate change. The overall assessment was structured according to Moreno and Becken's five-step approach, including system analysis, identification of activity subsystems and risks, vulnerability assessment, integration for the destination as a whole through scenario analysis, and communication of results.

The methodology for assessing the climate vulnerability of the health sector included identification of the key climate risks and their impact on public health, analysis of the existing health infrastructure and capacities, and an assessment of the sensitivity of vulnerable groups. Climate change data, such as extreme temperatures, changes in precipitation patterns, and the frequency of natural disasters, were analysed to determine potential health risks.

To assess the vulnerability of the water sector to various climate variables, analyses were conducted that included the quantification of Montenegro's water resources through a water balance assessment and a comparison of water availability and consumption, taking into account the impacts of climate change. In addition, the water footprint concept was applied to understand the key role of water resources in preserving water security and building climate change resilience. A flood vulnerability assessment was carried out through the integration of spatial and economic modelling, as well as an assessment of sensitivity to flash floods, with an additional analysis of economic vulnerability to river floods.

To assess the existing capacities of key organizations and stakeholders, a consultative process with national institutions was designed to enable a comprehensive assessment of capacities and needs in the field of climate change. The process was conducted in a participatory and inclusive manner, with a special focus on improving transparency.

The activities of the expert team had a multi-layered function – besides serving as an assessment tool, those activities simultaneously contributed to capacity building, awareness-raising, and informing institutions about key aspects of transparency in the field of climate change. INn 2023, the team conducted consultations with 20 institutions and a total of 76 participants, through direct meetings, workshops, and online questionnaires. Of the total number of participants, 51 (67%) were women, and 25 (33%) were men.

The methodology included the use of questionnaires as the primary tool for assessing capacities and identifying the needs of institutions at the national and local levels. In accordance with this approach, the questionnaire used by experts for CCAP development was adapted to cover all relevant elements of climate policy that were subject to analysis within the "Capacity Building Initiative for Transparency (CBIT)" project.

Based on the analyses conducted, basic conclusions were drawn and presented in this document in a simplified form. These analyses further guided the consultative process and contributed to the definition of the vision, mission, measures, and recommendations that form an integral part of the CCAP.

3.1 Analysis of the observed climate change and extreme climate conditions

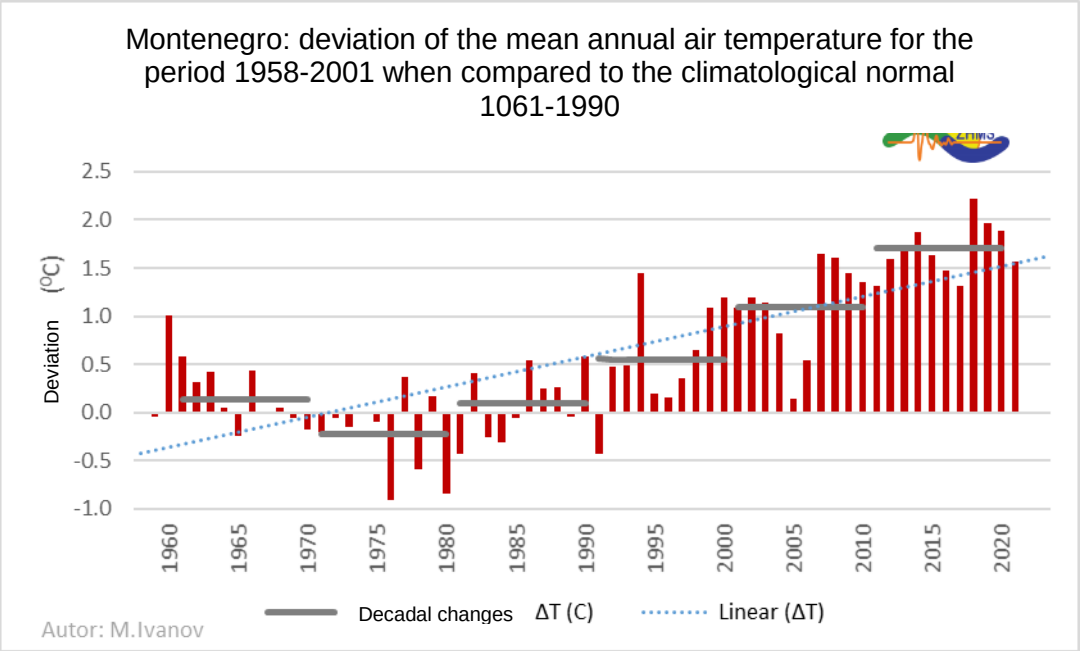
Montenegro is located in the northern temperate climate zone, characterized by clearly differentiated seasonal variations of meteorological factors. The position of Montenegro is such that its climate is influenced by both the Mediterranean as well as continental land masses, so the main climate types are the Mediterranean (with hot summers and mild, rainy winters) and continental/mountainous (warm summers and cold winters with lots of snow). However, a dynamic landscape of mountains, valleys and gorges creates sharp altitudinal changes, and together with the patchwork of water bodies and varying vegetational cover modifies the main climate types, resulting in very diverse local climatic conditions with numerous transitional forms.

The highest mean annual temperatures are on the coast (15,8˚C), and the lowest in the North (Zabljak region – 4,6˚C). Precipitation, on the other hand, has a very uneven distribution, primarily owing to the

varied topography and the proximity to the sea, and ranges from 800 mm per annum in the far north to 5,000 mm per annum in the southwest.

Rising temperatures, increased frequencies and duration of droughts, heat waves, floods, forest fires and weather extremes are already taking a toll on the society and the economy, especially on the key sectors on which it primarily relies – agriculture, tourism and energy. The negative effects of the climate impacts are expected to intensify. For this, Montenegro needs to increase and accelerate the efforts that would ensure its long-term resilience to climate change[3].

In the past few decades, changes have been observed in the two main climatic factors – temperature and precipitation. In terms of temperatures, the territory of Montenegro is becoming warmer, indicated by the increasing trend in mean annual temperatures in each decade, the current one being the warmest on record (Figure 3.1). Deviations from the climatological normal for the decade 2011-2020, in relation to the reference period 1961-1990, were +1,8˚C for the central and northern regions, and +1,9˚C for the coastal region (M.Ivanov, ZHMS)[4] (Raicevic et al 2022). Increases have been observed in the values of minimum and maximum daily temperatures, and significantly so in the number of tropical and warm days and nights and the length of the heat waves (M.Ivanov, ZHMS)[5].



Source: IHMS

[3] Conclusions were drawn from the following analyses:

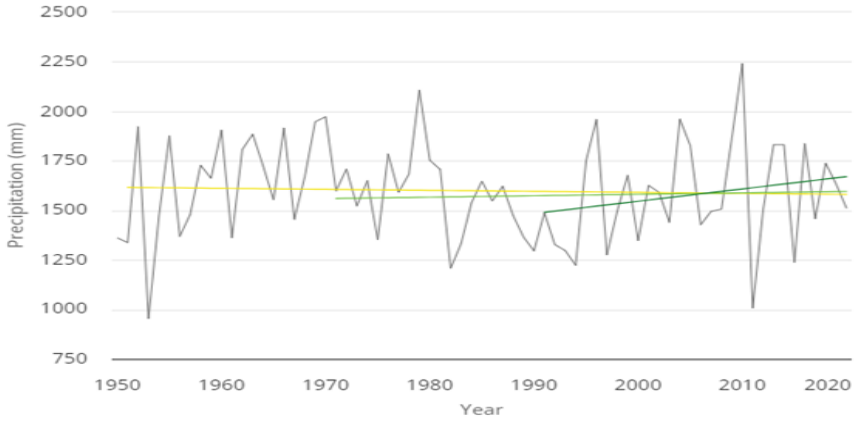
- **Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the agriculture sector**, UNDP Montenegro, December 2022.
- **Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the tourism sector**, UNDP Montenegro, December 2022.
- **Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the health sector,** UNDP Montenegro, December 2022.
- **Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the water sector,** UNDP Montenegro, December 2022.

[4] Second and Third National Communication on Climate Change

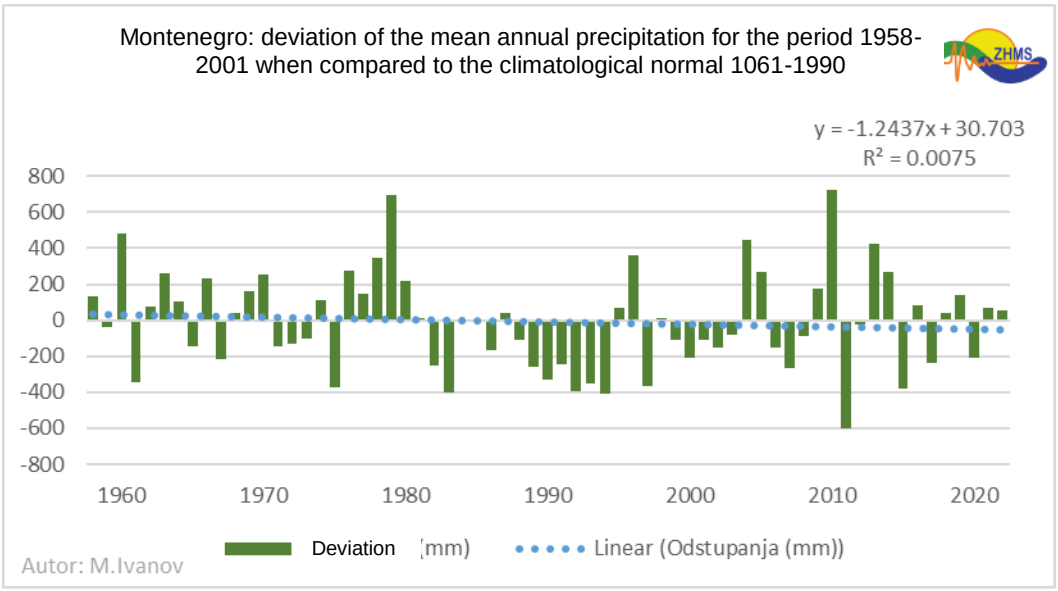
[5] Second and Third National Communication on Climate Change

As far as precipitation is concerned, the observed trend is of decadal decrease since the middle of last century, with the exception of decade 2000-2010, where observations were driven by extreme precipitation events (see Figure 3.2 below). The last decade had lower average precipitation than previously recorded, with five years experiencing the hydrological droughts. These events are mostly responsible for the negative deviations from the climate normal of -12% and -10% in the coastal and central zones respectively. The Northern region had a positive deviation of +4% in relation to the climate normal.[6] Decreasing trendline in precipitation is observed for the summer months for the whole of the country.

Figure 3.2 Precipitation annual trends with significance of trend per decade



Source: World Bank Climate Change Knowledge Portal



Source: IHMS

3.2 Overview of the expected climate change with the assessment of key risks

There are a range of climate modelling data available in different domains. This section uses climate modelling data from the World Bank's Climate Change Knowledge Portal (CCKP).[7] The CCKP models a range of climate scenarios on a suite of climate indicators e.g. precipitation, temperature etc., to show possible projections of these indicators. Crucially, it allows an analysis by selecting different projected climatology and emission scenarios, which are called Shared Socioeconomic Pathways (SSPs). SSPs

[6] Second and Third National Communication on Climate Change

[7] https://climateknowledgeportal.worldbank.org/

are scenarios that provide insight into future climates based on different GHG emission levels, degree and pathway of the social and economic development, as well as the intensity of carbon reduction efforts. The climate projection data that feeds into these pathways come from CMIP (Coupled Model Inter-comparison Projects), and CMIP6, the most recent version, is advised to be used as it's the foundational data in the IPCC 6th Assessment Report.

The future climate scenarios are presented through five SSPs: SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5, which present different societal development pathways. The total radiative forcing level by 2100 (the cumulative measure of GHG emissions from all sources) is presented at the end of each pathway (i.e., - 1.9, -2.6, -4.5, 7.0, 8.5, etc.).

- **SSP1-1.9** is the most optimistic scenario and global emissions are cut to net-zero around 2050. This is the only scenario that aligns with the Paris Accord of keeping global warming to 1.5°C by the end of the century.
- **SSP1-2.6** supports increasing sustainability with global emissions cut severely, but reach net-zero after 2050.
- **SSP2-4.5** presents a 'middle of the road' scenario in which emissions remain around current levels, before starting to fall around mid-century, but do not reach net-zero by 2100.
- **SSP3-7.0** presents a pathway in which countries are increasingly competitive and emissions continue to climb, roughly doubling from current levels by 2100.
- **SSP5-8.5** presents a future based on an intensified exploitation of fossil fuel resources where global markets are increasingly integrated leading to innovations and technological progress.[8]

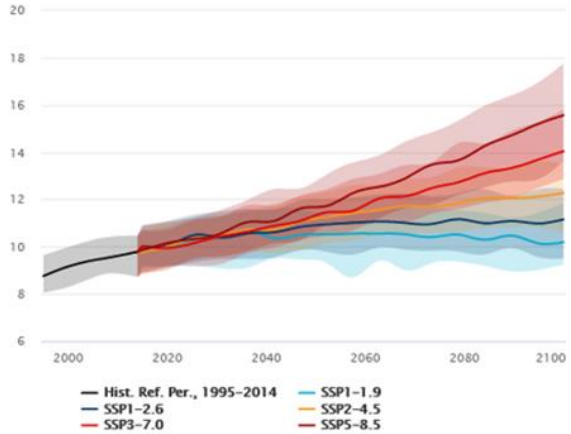
To ensure that adaptation planning factors in the most likely eventualities, this section uses the middle of the road scenario of SSP2-4.5, but where possible shows the impact the other pathways could have on key climate indicators such as temperature and precipitation.

The results from the climate projections show an increase of around 2°C in the mean annual temperature are to be expected for SSP2-4.5, from 10˚C in 2020 to around 12.20˚C in 2100 (Figure 7.3a). Figure 7.3b to Figure 7.3d shows the temperature anomaly across the year for three time periods, with a temperature anomaly in August of around 2˚C, 3˚C and 4˚C across the respective time periods 2020-2039, 2040-2059 and 2080-2099. Showing that the biggest rise in temperatures will occur over the summer months, with far less pronounced increase in temperatures over the winter months, although still above 2˚C warming in the 2080-2099 can be seen over these months.

The number of summer days, tropical days and tropical nights, warm days and nights, length of heatwaves are also expected to increase, while the number of frost days to decrease (Raicevic et al 2022).

Figure 3.3 (A-D) Impact of climate change on temperature in Montenegro

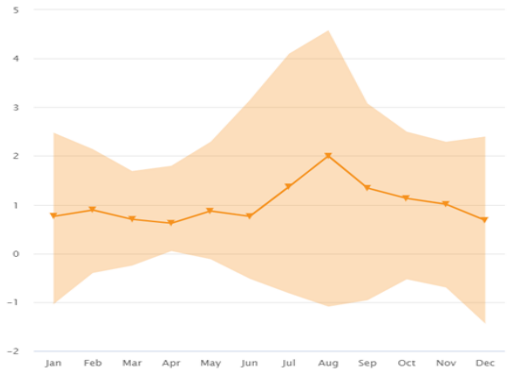
(A) Projected mean temperature (˚C)



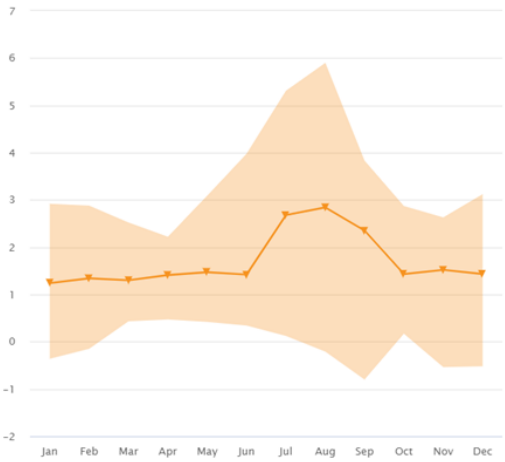
[8] World Bank. 2021. User Manual, Climate Change Knowledge Portal. www.climateknowledgeportal.worldbank.org

Source: World Bank Climate Change Knowledge Portal

(B) Projected Max Temperature anomaly for 2020-2039, SSP2-4.5 (ref period 1995-2014)

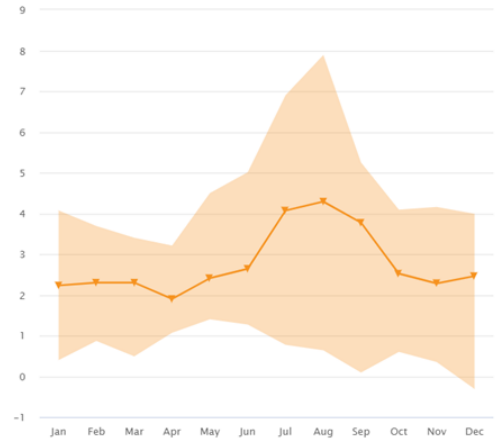


(C) Projected Mean Temperature anomaly for 2040-2059, SSP2-4.5 (ref period 1995-2014)



Source: World Bank Climate Change Knowledge Portal

(D) Projected Mean Temperature anomaly for 2080-2099, SSP2-4.5 (ref period 1995-2014)



Source: World Bank Climate Change Knowledge Portal

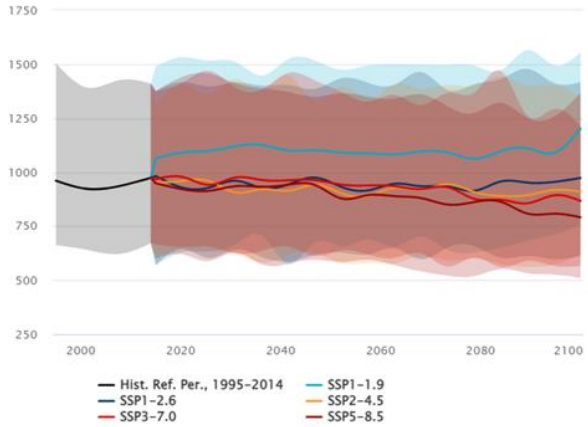
In terms of the precipitation, the mean annual rainfall is expected to decrease, especially during the summer months and to increase in the winter months in some parts of the country. By the end of the century, precipitation is expected to experience a decrease, by around 6% based on SSP2-4.5 scenario, and up to 25% under SSP5-8.5. However, under the SSP1-1.19 rainfall is predicted to increase up to 23% over the course of the century. The difference in forecast for precipitation according to the different scenarios shows the extent of the uncertainty of climate change on precipitation levels in Montenegro, which makes adaptation planning more complex.

Under SSP2.4-5 the precipitation anomalies shows that over 2040-2099 that its likely to see the distribution of rainfall over a year change, with potentially wetter winters and drier summers (see Figures 3.4 c & 3.4d). Significant changes are expected in snowfall, which is expected to decrease from −50% in the north, to more than 90% in central parts by the end of the century. At the same time, the number of days with snow is expected to decrease from 50% to over 70%, with the overall shortening of the snowfall season (Third National Communication).

The SPEI drought index combines precipitation and temperature data and gives an idea of the impact of climate change on possible drought hazard. In Figure 3.4b, all scenarios except SSP1-1.9 show an increase in the chance of drought conditions (based on the 1995-2014 reference period), with the higher increases, as expected, in the more severe scenarios such as SSP3-7.0 and SSP5-8.5.

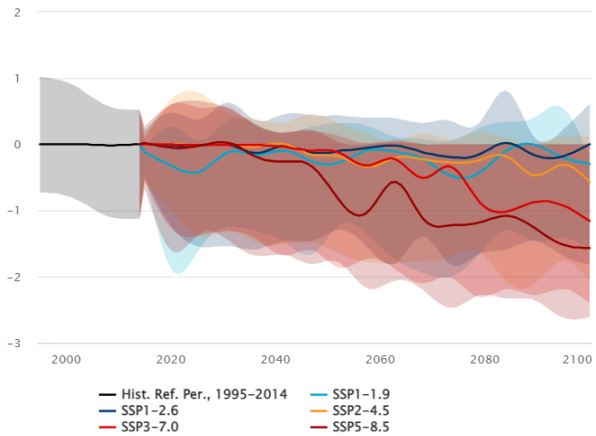
Figure 4.4 (A-D) Impact of climate change on precipitation in Montenegro

(A) Projected precipitation (mm)



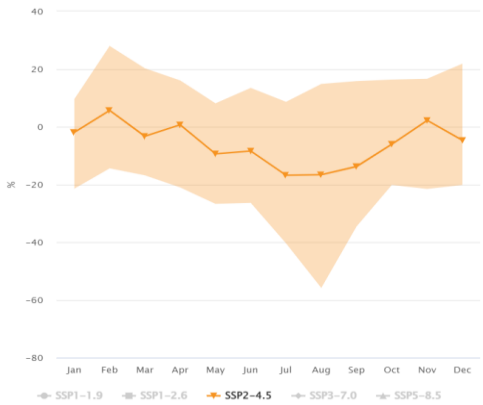
Source: World Bank Climate Change Knowledge Portal

B) Projected annual draught index SPEI (ref. period 1995-2014)

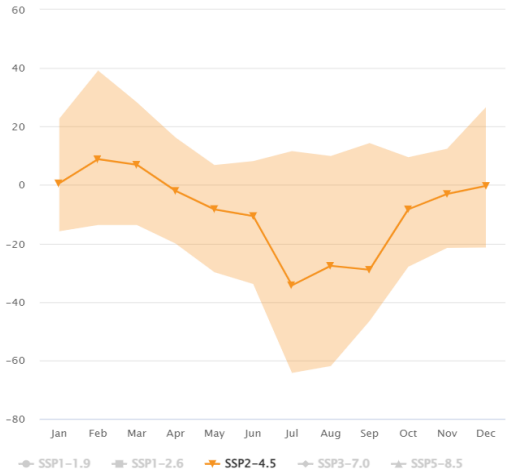


Source: World Bank Climate Change Knowledge Portal

(C) Projected Precipitation Percent Change Anomaly for 2040-2059, SSP2-4.5 (ref period 1995-2014)



(A) Projected Precipitation Percent Change Anomaly for 2080-2099, SSP2-4.5 (ref period 1995-2014)



Source: World Bank Climate Change Knowledge Portal

3.3 Analysis of the observed climate change impacts

Changes in temperature patterns and precipitation regimes in Montenegro significantly contribute to an increase in the frequency, intensity, and duration of extreme climatic and weather events, including floods, droughts, heavy rainfall, snowstorms, strong winds, heatwaves, landslides, and wildfires. These events have become more pronounced, complex, and have increasingly lead to significant social and economic and ecological consequences over the past decades. These are the most impactful manifestations of climate change, with consequences such as damages to infrastructure, property and agricultural production, disruptions of activity as well as a suite of health and safety issues, injury and death, all of which have already caused significant social problems and economic losses in Montenegro. The key climate-related hazards that have impacted Montenegro in recent decades are droughts, pluvial and fluvial flooding, wildfires and landslides, consequences of which require comprehensive adaptation measures and enhanced resilience of communities.

Droughts: Montenegro is by its geographic characteristics susceptible to droughts which have had the biggest impact of any climate hazard, especially in the coastal region, Zeta and Bjelopavlici plains and some northern mountain regions. Droughts affect water level in rivers, agricultural production, forests and the energy production amongst other impacts (Raicevic et al 2022). Since the 1990s, the frequency

and duration of droughts has increased. The most severe droughts were recorded in 2003, 2011, 2017. 2018 and 2019. In 2017, water levels were at their lowest points since measurements began in 1948.[9,10]

Floods: Floods in Montenegro have been a consequence of both extreme and multi-day rainfall events. In recent decades, a growing trend in precipitation intensity has been observed, particularly in the northern region of the country, where a significant positive change in daily precipitation intensity has been registered (IHMS). These changes often lead to floods caused by heavy rainfall and river overflows. The major floods were recorded in 2007, 2009, 2010 and 2019. The most impacted areas were in the central zone (Zeta and Bjelopavlici), Ulcinj Field and the Lim River valley (IHMS). The most severe flood happened in 2010, which affected around 30,000 hectares of agricultural land and accrued economic losses of €44 million (1.4% of GDP). In addition to direct damage, floods also caused a series of further consequences, in the form of landslides, infrastructure damages, reduced water quality, pollution, disruptions to transport and everyday activities, including access to healthcare. In 2010 a significant flooding event caused extensive material damage and evacuations in the municipalities of Cetinje, Niksic and Ulcinj.

Wildfires: Arid conditions and high temperatures, combined with the strong winds are causing increasingly more frequent wildfires across the territory of Montenegro. Apart from damages to forests, fires have posed significant health problems, as well as disruption of transport, especially during tourist seasons. South and central regions of Montenegro are extremely prone to forest fires, which have become more frequent and intensive in the past years.

The above changes in temperature patterns, precipitation regimes, and increasingly frequent extreme weather event confirm the findings of Montenegro's Disaster Risk Assessment, which recognizes climate change as one of the key risk factors. Droughts are particularly highlighted as a threat because they can lead to reduced agricultural yields, land degradation, and limited availability of water for drinking and irrigation. At the same time, wildfires pose a significant risk to people, infrastructure, and biodiversity, and additionally contribute to increased GHG emissions through biomass combustion.

These findings clearly indicate that there is the need for systematic integration of climate risk assessment into national and sectoral climate change adaptation strategies, which would ensure timely and effective planning of measures that can mitigate the impact of climate disasters on communities, the economy, and natural resources, as well as strengthen society's resilience to existing and future climate challenges.

3.4 Analysis of key vulnerabilities

The approach applied for vulnerability assessment that helped form a baseline for this NAP is based on the IPCC Vulnerability Assessment Method (IPCC Third Assessment Report 2001), according to which the vulnerability to climate change is determined as a combination of three factors:

- **Exposure** – factors determining to which climate change impacts the country/sector/community is exposed to. Exposure depends on the natural and physical factors, such as geographic location, altitude, vicinity of the sea, hydrological conditions etc. Since it is external to the system, the exposure can be partially controlled and requires global efforts on mitigating climate change.
- **Sensitivity** – refers to the degree to which the country/ sector/ community will be impacted by climate change. This is an internal property of the system and depends on the number of factors, including demographic structure, social and economic circumstances, existing policies, health

[9] Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the agriculture sector, UNDP Montenegro, December 2022.
Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the tourism sector, UNDP Montenegro, December 2022.
Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the health sector, UNDP Montenegro, December 2022.
Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the water sector, UNDP Montenegro, December 2022.
[10] Ministry of Sustainable Development and Tourism, 2020, Institute for Hydrometeorology and Seismology, Montenegro National Drought Plan.

system, infrastructure and cultural specificities. Greater sensitivity means higher potential for negative impact.

- **Adaptive capacity** – are factors determining to which degree the country/sector/community can respond to climate change, mitigate harmful effects and enhance resilience of the system. This capacity is also an internal property of the system, and it depends on the availability of human, institutional, technical and financial resources, as well as on the political will and management capacities.

Adaptation to climate change aims to reduce the sensitivity and enhance the capacity of communities, sectors and systems to successfully tackle negative impact of climate change and to adapt to them. This goal be achieved through various approaches, which include policy adjustment, capacity building and institutional strengthening, research for evidence-based decision making and implementation of technical and infrastructural measures, such as introduction of new production practices, improvement of resource management or construction of building resilient to climate change.

A detailed vulnerability assessment was conducted for each of the sectors as part of the CCAP development. The analysis covered all three vulnerability components - exposure, adaptive capacity and sensitivity – and made it possible to identify specific weaknesses, needs and opportunities within each sector. The results of these analyses are presented in the Appendix D: Conclusions on Climate Vulnerability, which provides the basis for the definition of priority adaptation measures.

The following sections provide a summary overview of the key vulnerability findings by sectors, which are used as a basis for the formulation of the strategic and operational measures in the Adaptation Plan.

3.4.1. Agriculture

Dependence of agriculture on specific temperature and precipitation regimes, and the fact that most agricultural activity is conducted outdoors thus being exposed to weather impacts, including the extreme events, makes the agriculture sector extremely vulnerable to climate change. The observed changes in temperatures, precipitation, occurrence and duration of climate hazards (droughts and floods in particular) already impact the production of food, its security, safety and quality, and will increasingly do so in the future, according to the climate projections. Apart from impacts on the livestock and crops, the weather affects agricultural workers themselves, who are directly exposed, impairing their productivity and potentially causing harm to their health.

Montenegrin agriculture is experiencing an increase in temperatures, changes in precipitation patterns, increased incidence and duration of droughts, storms (hailstorms, strong winds), late spring and early

autumn frosts, increase in pests and diseases and changes in aquatic habitats (marine and freshwater) such as water warming and invasive species, which affect the fishery and aquaculture subsectors.

In summary, the key climate vulnerability findings for the agriculture sector include[11]:

- Higher temperatures, causing earlier vegetation period affecting populations of pollinators, reduced crop yields, especially for fruit, and intensified heat stress to livestock, which additionally reduces its productivity;
- Limited water availability, especially in summer months, leads to reduced irrigation capacities. Zeta and Bjelopavlici valleys and the coastal area have been identified as the most vulnerable to droughts;
- Changes in conditions of marine and riverine habitats affecting fisheries, in addition to sedimentation of rivers
- Damage to crops from weather related events (hail, high winds, floods) have become more frequent and intensive, posing threat to yields and production capacities.
- Lack of awareness of the needs and importance of adaptive capacity of farmers to respond to climate change.

Appendix D: Conclusions on Climate Vulnerabilities

3.4.2. Water

The biggest impact of climate change on the water sector is in the reduction of the water balance in all river basins. A reduction of up to 27% in average annual flow is expected by the end of the century, primarily due to the reduction in precipitation. The consequences of this will be felt across all other sectors – primarily agriculture and health.[12]

In summary, the key climate vulnerability findings for the water sector are:

- Lack of data (non-existent, incomplete, or unharmonized data) and lack of interdepartmental cooperation hinder adaptation assessment and planning;
- Inadequate maintenance and planning of water source protection zones pose a risk to water supply; limited water availability in summer affects key sectors, especially in areas already experiencing water deficits. For example, coastal regions, particularly municipalities of Herceg Novi, Kotor, Tivat, and Budva, where water consumption significantly increases in summer due to the tourist season, while at the same time water supply sources decrease. Zeta valley and surrounding areas – high temperatures and intensive agriculture contribute to seasonal water shortages. Northern regions, although richer in water, experience localized deficits due to poor infrastructure and lack of water availability for smaller settlements.
- Frequent floods in the coastal region and inland, which affects water quality reduction, ecosystems, infrastructure, households, agriculture, and tourism;
- Deforestation and agriculture impact water quality and availability and increase sedimentation/erosion;
- Deficient water management system with low capacities for climate change risk reduction;
- Local population possesses valuable and useful knowledge about ecosystem-based adaptation, which should be better utilized.

Appendix D: Conclusions on Climate Vulnerability

3.4.3. Health

Climate change affects public health through a series of interlinked factors, including the quality and availability of drinking water, air quality, food safety and availability, social circumstances, and basic security during extreme weather events. Although the healthcare system in Montenegro currently possesses certain resources – including specialized institutions such as pulmonary hospitals, medical emergency centres, counselling services, and ER services, including ambulances – there is a need for

[11] IHMS analyses and data.
[12] Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the water sector, UNDP Montenegro, December 2022.

a better understanding of expected climate change and an improvement in preventive action to strengthen the health sector's resilience.[13]

In summary, the key climate vulnerability findings for the health sector are:

- Higher temperatures lead to an increase in mortality and incidence of diseases among vulnerable population groups, especially chronic patients. Also, the incidence of foodborne and vector-borne diseases increases, and the quality of nutrition decreases;
- In situations of higher relative humidity– which is typical for colder months – air pollution can linger longer in the lower layers of the atmosphere, which negatively impacts the respiratory health. In summer months, poor air quality is further exacerbated by wildfires and burning of fossil fuels. More intense floods, especially in the coastal region and inland, further exacerbate drinking water quality, cause damage to agricultural land, displacement of flood-affected populations, increased risk of infectious diseases, as well as negative effects on mental health;
- Insufficient number of healthcare professionals and room for improvement of capacities to understand and plan climate risk adaptation activities;
- Geographical and regional discrepancies in access to healthcare, especially for remote communities, socially vulnerable groups, and chronic patients, further complicate an effective response to climate challenges.

For example:

- Positive aspects of the system include legislation that guarantees health protection for all citizens, as well as good health screening of vulnerable populations.

Appendix D: Conclusions on Climate Vulnerability

3.4.4. Tourism

Tourism is one of the three most important economic sectors in Montenegro and accounts for one quarter of the national economy approximately. This sector, however, is highly vulnerable to the impacts of climate change. Changes in temperatures, precipitation - especially reduced snowfall – as well as increasingly frequent extreme weather events are already taking a toll on tourism activities and income generation.[14]

In summary, the key climate vulnerability findings for the tourism sector are:

- Lack of reliable data and analyses on climate change impact on tourism hinders planning and informed decision-making;
- Limited diversification of tourism products, with high dependence on seasonal and coastal tourism, although Montenegro possesses significant potential for development of various niche branches;
- Uneven seasonal and spatial distribution of tourist arrivals, which creates pressure on certain locations during the main season and makes sustainable management difficult;
- Absence of specific guidelines for climate change adaptation, as well as a lack of a comprehensive and operational framework for tourism sustainability;
- High sensitivity of the tourism sector and its infrastructure to climate risks, especially in coastal and mountainous areas;
- Low readiness of the sector to respond to climate change-induced hazards, with insufficiently developed risk and crisis management plans.

Appendix D: Conclusions on Climate Vulnerabilities

3.5 Assessment of institutional capacities for climate change adaptation

Building institutional capacity to address climate change is recognized as an important component of the Government of Montenegro's climate change adaptation efforts. In Montenegro, like other countries,

[13] Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the health sector, UNDP Montenegro, December 2022.
[14] Report on gender-sensitive climate risk assessment with a focus on filling information gaps and priority measures addressing climate-induced vulnerabilities and gender-differentiated impacts in the tourism sector, UNDP Montenegro, December 2022.

adaptation to climate change cannot be effective if it is done in isolation and separated from development. Integrating adaptation into planning offers a means to scale up adaptation measures; provides a platform to support and channel private-sector investments; allows adaptation to be aligned with existing long-term national development plans along with international efforts, such as the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction, which are key elements of the global drive to achieve sustainable and fair economic, social and environment-friendly growth. Disaster risk reduction and building resilience are of essential importance within efforts to achieve Agenda 2030 goals.

Montenegro has taken on commitments under the Agenda 2030, which include improving education, strengthening the economy, reducing poverty and inequality, promoting health, and gender equality. It has also committed to environmental protection, preservation of natural resources, and disaster risk reduction, reflecting the priorities of the Sendai Framework. In accordance with the Paris Agreement, Montenegro has committed to reducing GHG emissions and climate change adaptation. Thus, Montenegro's long-term, low-carbon, resilient growth can best be achieved by integrating adaptation into long-term strategies and planning.

In order to assess the existing capacity of the key organizations and stakeholders, the consultation process with state institutions was designed to ensure a comprehensive assessment of capacities and needs in the field of climate change through a participatory and inclusive process, with a focus on improving transparency.

To collect data, a questionnaire was used that involved assessing capacities in the following key categories:

- Capacity in governance and policies;
- Leadership and organizational capacity;
- Capacity for strategic planning;
- Data, information, and analysis capacity;
- Human resource capacity;
- Financial capacity;
- Capacities for implementation, monitoring, and evaluation, and knowledge management.
- Capacity to assess gender-sensitive needs in climate policies

Capacity ratings are defined on a scale of 1- low capacity, 2- basic capacity, and 3- strong capacity.

The findings of the Assessment of Montenegro's Disaster Risk Management Capacity were also taken into account during the preparation of the CCAP. The main conclusions and recommendations of this analysis indicate that the existing legal framework does not sufficiently cover disaster risk assessment or the systematic implementation of climate change adaptation measures. Coordination mechanisms for planning and implementing adaptation measures are not sufficiently developed or functional, while limited interdepartmental cooperation further complicates the implementation of measures to reduce climate and natural risks. The lack of a proactive approach to address droughts is particularly obvious, with poor information exchange among sectors. In addition, strategic documents often do not clearly define institutional responsibilities, which slows down the operational implementation of necessary measures. The absence of a National Drought Authority (NDA) is an additional challenge, as well as the lack of a permanent network of national drought reporters, whose establishment – in accordance with the National Drought Plan – would contribute to more effective monitoring, reporting, and response. Strengthening institutional cooperation with the Institute for Hydrometeorology and Seismology (IHMS), as a key technical institution for early identification and monitoring of drought periods, is also recommended.

Knowledge transfer is not systematically organized, and specialized training is mainly conducted through international projects, without adequate institutional support for continuous professional development. Although there is a certain level of knowledge and expertise within competent institutions, further capacity building and continuous education are necessary. The financing of activities mostly relies on EU funds and international donations, while national budgetary expenditures for this area are insufficient. Administrative obstacles and business barriers slow down the implementation of planned measures further. Strengthening of the legal framework, improvement of interdepartmental cooperation,

enhancement of institutional capacities, and broader public awareness raising on climate change and risk reduction measures are recommended.

3.6. Summary of capacity assessment results

This chapter is based on the SWOT analysis and Gap Analysis to strengthen institutional mechanisms for transparency in the field of climate change, prepared by a group of experts[15] in November 2023 within the framework of the CBIT project of the then Ministry of Tourism, Ecology, Sustainable Development and Development of the North. Additionally, the findings of the Assessment of Montenegro's Disaster Risk Management Capacity were also taken into account.

After the implemented methodology and extensive consultations, analysis of feedback from institutional representatives, the expert team assessed the missing capacities, identified deficiencies, and the system's needs to achieve transparency. In the field of assessing capacities and needs within institutional governance, the strategic and regulatory framework, and in accordance with the adopted methodology, institutional capacity was characterized as basic.

The fundamentals of the strategic and regulatory framework exist, but additional work is recommended as follows: finalization of the CCAP; finalization of amendments to the Law on Protection from Adverse Effects of Climate Change and Ozone Layer Protection, including secondary legislation; revision of the Nationally Determined Contribution to Greenhouse Gas Emission Reduction (NDC) and its alignment with de-carbonization goals adopted within the Energy Community (EnC); finalization of the development of the National Energy and Climate Plan (NECP) in line with the guidelines and objectives adopted within the Energy Community; preparation of a Low-Carbon Development Strategy in a way that considers the possibility of integrating this document with the National Energy and Climate Plan (NECP). Additionally, it is necessary for all state administration institutions to establish a clear mandate and responsibilities for mitigating and/or adapting to climate change through amendments to the Regulation on the Organization and Operation of Public Administration and their internal acts. Analysing the results of the structured assessment of public, private and civil society organizations made it clear that the weak coordination and cooperation on climate change adaptation (CCA) has been observed overall, whereby *ad hoc* approaches (from project to project and or driven by individual interests and capacities) prevail. Capacity scores primarily ranged between low and basic. In this context, the preparation of the CCAP presents an important opportunity to more firmly establish the framework for systematic and coordinated response to climate change by all the relevant institutions.

In the domain of administrative capacities and needs, the existing situation has been assessed as basic. It has been established that only some institutions have structured positions with job descriptions and tasks in the field of climate change mitigation and adaptation through the Regulation on Internal Organization and Job Classification. Practice shows that tasks and responsibilities within organizational structures that should deal with climate change issues are carried out based on ad hoc decisions of the management structure, according to current needs or project activities. By analysing the existing situation in relation to the target state, i.e., the state that makes it possible to meet transparency conditions in the field of climate change, it can be concluded that further improvement of administrative capacities is needed.

The capacities and financing needs in the field of climate change have been assessed as low, as current financial resources are insufficient to achieve the goals and priorities in the area of climate change mitigation and/or adaptation to climate change. Financing sources for mitigation and/or adaptation do not show a stable, sustainable, and growing trend in recent years. There are no initiatives for sustainable financing. The majority of institutions do not systematically address ESG (environmental, social, and governance) criteria in their activities. The budget classification in Montenegro, both economic and functional, does not recognize climate-relevant expenditures. This initially assessed low capacity in the area of climate finance is compatible with capacity assessments in most other aspects of this analysis. In this regard, the recommendations are as follows: given the characteristics of the existing budget classification, policies, activities, and projects in the field of climate change (climate-relevant expenditures of the current budget and recognized capital budget projects), they should be further analysed and monitored through programs and subprograms, i.e., program and project

[15] Mira Vukčević, Đorđije Vulikić, Gordana Đurović and Sanja Elezović

classification, to arrive at possible solutions for improving the information system for public finance management and recognizing these expenditures in the coming period, using resources from the CBIT project. The development of several important strategic documents is underway, which will provide an updated overview of measures and planned projects in the field of mitigation and adaptation. Financial indicators for climate-relevant expenditures should be aligned in the next phase of CBIT project implementation to create synergy and validate all financial data and estimates.

In the domain of monitoring and reporting capacities, verification, and evaluation, **the assessment is that there is a basic capacity.** The Law on Protection from Adverse Effects of Climate Change prescribes the obligation to establish the national MRV-E system as a mechanism to support and exchange information in the field of climate change mitigation, adaptation to climate change, climate-relevant finances, and support. An analysis of the current situation has determined that the strategic and regulatory framework has been further strengthened compared to the previous period, and there is a clear legal and normative basis for establishing the national MRV-E system. Additional requirements for establishing the MRV-E system stem from Montenegro's obligation to implement the decision of the Energy Community Ministerial Council of December 15, 2022, regarding harmonization with a set of EU regulations in the field of climate change and energy, including the establishment of the MRV-E system. The Ministry of Tourism, Ecology, Sustainable Development and Northern Region Development has key responsibilities and tasks in the functional units in the existing proposal for the national MRV-E system. However, full functionality of the MRV-E system has not yet been established due to frequent changes in the organizational structure, lack of qualified staff, weak inter-sectoral communication, etc. Therefore, in order to improve capacities and achieve target values, it is proposed: Finalization of amendments to the Law on Protection from Adverse Effects of Climate Change and Ozone Layer Protection, through the development of appropriate sub-legal acts, to ensure necessary prerequisites for its functioning. This primarily refers to inter-sectoral cooperation. In addition, it is necessary to establish a stable and frequent training system for employees in all relevant institutions whose job description includes data collection, entry, processing, analysis, and monitoring, as well as managing the MRV-E system.

The capacities and knowledge management needs have been assessed as low. A detailed analysis of the state of relevant institutions reveals a number of essential shortcomings that must be addressed when building capacities for transparency. Institutions have an insufficient number of employees in specific roles, and their professional and communication connections with relevant partners at the national level are weak or negligible. There are almost no mechanisms for capacity building through continuous education, especially for the implementation of regulations. The system for data acquisition, processing, and analysis is poorly developed, and the latest data from relevant international entities are underutilized. Strategic and planning documents are not updated efficiently in line with the latest knowledge and practices in the field.

Capacities and needs for gender-sensitive assessment in the areas of climate change in Montenegro have been assessed as basic. Female leadership and awareness of the need to include the gender aspect in planning and implementing climate policies are sporadic and not sufficiently developed. Gender-responsive budgeting is gradually being introduced, and training is being conducted, but results are still expected. At the strategic level, only a few institutions (Ministry of Agriculture and the Institute of Public Health) include the gender aspect in planning some of their policies, but generally, there is no systematic approach in this area, despite the obligation to mainstream gender into all public policies as prescribed by the Law on Gender Equality. Most national institutions have gender focal points, and their advantage lies in years of collaboration as a group (under the coordination of the Ministry for Human and Minority Rights), which provides a good basis for further building their capacities for mitigation and adaptation. Municipalities also have gender focal points, and it is necessary to create a network at both levels and strengthen it, especially in terms of involving local populations from different social groups in creating and implementing mitigation and adaptation initiatives. The Ministry of Ecology and Development of North has a gender focal point for UNFCCC, which provides a good basis for collaboration and experience exchange with other countries. Some gender-disaggregated data collected and processed by the Statistical Office are used in a small number of institutions, but they are insufficient for systematic monitoring. There is no specialized education on the gender aspect of climate change within the Human Resources Management Authority.

3.7. Situation analysis: gender, equity and inclusivity

The Constitution of Montenegro and national legislation stipulate equal rights for women and men, while the Gender Equality Law stipulates gender mainstreaming in all policies. Montenegro implements several strategies for protection of women's rights and women's empowerment, including the National strategy for gender equality, National Strategy for Development of Women Entrepreneurship, Action Plan for Implementation of the Istanbul Convention (protection from domestic and gender-based violence), as well as the National Strategy for Social Inclusion of Roma. Among them, only the National Strategy for Gender Equality recognizes the interconnection between gender and climate change. Gender inequality persists due to the presence of gender stereotypes, traditional gender roles and the lack of administrative capacity to implement gender equality policies and to protect women from gender-based discrimination.

In 2023, Montenegro developed the second Gender Equality Index using the methodology of the European Institute for Gender Equality. The index tracks inequality in six domains: work, health, money, power, knowledge and time. The index shows that the largest gender equality gaps are in the areas of money and power. Those are connected with gender pay gap, feminization of poverty, especially in the older age, prevalence of men among property and landowners, as well as with the underrepresentation of women in political and economic decision making. Women work more, have less income and less free time, and their work is less valued. Women's life expectancy is longer, and women retire earlier than men. As women have lower incomes and lower pensions, they are more at risk of poverty in the older age. Even though there are more female than male university graduates, women are still concentrated in lower-paid jobs, and there is a significant underrepresentation of women in political and economic decision-making. Women are the primary family caretakers and are significantly more burdened with housework than men.[16] All the aforementioned makes women more vulnerable to negative effects of climate change.

Women are less present in the labour market in comparison with men (46,8% of women and 53,2% of men)[17] and face horizontal and vertical segregation in the labour market. Women are overrepresented among the low-skilled labour in agriculture, tourism and trade. Sensitive and marginalized groups like Roma and Egyptian women, as well as women with disabilities and unemployed women are especially vulnerable to climate change. Men are more present in low-skilled labour in construction businesses and are exposed to health risks due to climate change. Also, men working in rescue services, like firefighters, rescue officers, etc. are more likely to carry out the increased pressure and a workload in the adaptation process. There is a disproportion between the share of women educated for professions that are relevant for NAP, and the adequate labour sectors.

For example, there is a high rate of women among graduated students in Bio-technical Institute, Faculty for Civil Engineering and Faculty of Metallurgy, and the low percentage of women in the labour sectors[18] that usually absorb this type of professionals - Manufacturing, Transportation and Storage, Agriculture, Forestry and Fishing, Electricity, Gas, Steam and Air Conditioning Supply and Water supply, Sewerage, Waste Management and Remediation activities.

3.7.1. Gender considerations in Montenegro's agriculture sector

In agriculture, women are a minority among property owners, but make the majority among low-skilled workers. Women are restricted full involvement in agricultural production and rural development due to the following: limited access to the household budgeting, underrepresented involvement in associations, limited ownership over agriculture holdings, and their extensive involvement in the economy of care. All of these reasons reduce the chances of women to harness the potential for successful agricultural production[19]. Rural women, vulnerable and marginalized groups are not adequately involved in the climate policy planning process. In most of the cases, they are not present at consultative meetings with beneficiaries of various projects that are organized by institutions, international organizations and NGOs. This is especially valid for women living in the north and in remote villages, women with disabilities and Roma women, who are usually not informed about those

[16] Gender Action Plan and Gender Communication Plan with Gender Mainstreaming Features in the Design and Implementation of the NAP in Montenegro
[17] Labor Force Survey for III quarter of 2023
[18] Directorate for Statistics' classification of labour sectors
[19] UNDP NAP Vulnerability assessment for Agriculture

meetings/consultations, or do not have time to attend them, due to numerous obligations and hard work at home.

Despite the fact that the main national programs, like the annual Agriculture Budget, contain gender-sensitive measures, the percentage of women who benefit from these measures remains very low. Namely, as the gender analysis of the structure of beneficiaries of the Agriculture Budget measures[20] showed, regardless the fact that women make majority of fresh milk producers, they make a minority within subsidy beneficiaries and have received less than 10% of totally allocated funds, due to not having collaterals for bigger investments[21]. Due to the local budget limitations, most of the local municipalities are not able to support local farmers to cope with consequences of the extreme weather, or any other kind of crisis caused by climate change in the substantial way and the financial contributions from local budgets cover only the minimal percentage of the necessary amount for recovery of the farms. Local Disaster Risk Relief units do not have precise information about the most vulnerable households, like single women households, households with older citizens, those having a family member(s) with disabilities, households in remote areas, as well as settlements where Roma and Egyptians live. It makes them inadequately prepared to prevent and diminish negative consequences of natural hazard events and climate change, and to help local people to raise the level of resilience. When it comes to civil society actors, women business associations and NGOs put a significant effort in economic empowerment of women, political participation and protection from gender-based violence; yet, they don't recognize the interconnection between gender and climate change.

3.7.2. Gender considerations in Montenegro's water sector

Montenegro provides good access to piped water (91%) and sanitation (89%) services. However, access to publicly provided services is much lower. Approximately 76% of the Montenegrin population is connected to the public water supply and 43% to sewerage. Only 18% of all wastewater produced is effectively treated, mostly below the Urban Waste Water Treatment Directive standards, resulting in significant environmental and public health hazards. The situation in urban and rural areas is markedly disparate. In urban areas, more than 98% of the population has access to a public water supply and 71% has sewerage services.[22] In 2022, the Ombudsman conducted a field survey in Roma settlements in 13 municipalities.
Preliminary findings show that 42.2% of Roma still live in segregated settlements, facing the problem of overcrowding in households and with limited access to water and power supply[23].

A mismatch between educational resources and knowledge of women and their presence in the water sector labour market is evident. Share of women in the labour force - water supply, sewerage, waste management and remediation activities is 20,8%[24]**,** while the share of women among specialists/masters for water quality, water use and water protection is 46%[25]. Among graduate students of basic studies in disciplines concerned with remediation of waters, like chemical technology, women make 90%, while among specialists and masters in the same discipline, there is 88% and 85% of women respectively[26]. At the applied studies concerned with environmental protection, women make 72% among graduate students of basic studies, and 71% among those graduating at the level of specialists' studies.

[20] *Gender Analysis of the Agriculture Budget and Preparation of Policy Brief, OSCE, 2019, author Aleksandra Crvenica*
[21] Gender Action Plan and Gender Communication Plan with Gender Mainstreaming Features in the Design and Implementation of the NAP in Montenegro
[22] Water and Wastewater Services in the Danubius region, Danube Water Program, 2015. https://sos.danubis.org/eng/country-notes/montenegro/
[23]https://www.ombudsman.co.me/img-publications/53/coe%20polozaj%20roma%20i%20egip--ana%20u%20cg%20200x290%20final.pdf
[24] MONSTAT, Statistical Yearbook 2022
[25] Data was obtained for the purpose of this analysis in May 2022, from the Faculty for Civil Engineering, University of Montenegro. The percentage represents the average for the last 10 years, cumulative for specialist studies and master studies.
[26] Data was obtained for the purpose of this analysis in June, 2022 from the Faculty of Metallurgy, University of Montenegro. The numbers present an average percentage in the last 6 years.

3.7.3. Gender considerations in Montenegro's tourism sector

Despite the fact that the share of women in accommodation and restaurant businesses is 42,5%, the main legislative and policy document, the Law on Tourism and Hospitality, is not gender sensitive. The Tourism Development Strategy 2022-2025 recognizes that in the tourism sector, the bearers of activities are primarily micro, small and medium enterprises, which creates the preconditions for the development of a family business that enables the employment of more women. Montenegro's Tourism Development Strategy 2022-2025 recognizes the significance of women and female entrepreneurship in the tourism sector and highlights the need for their greater economic empowerment and inclusion. The document draws upon the Strategy for the Development of Women's Entrepreneurship 2021-2024, which aims to strengthen the role of women in entrepreneurship and tourism. Within the concept of inclusive tourism, special attention is paid to empowering women, youth, and marginalized groups, in line with OECD principles on inclusive growth. Furthermore, the strategy identifies gender equality as one of its fundamental goals, in line with the EU *acquis*. The social and economic stabilization of women is recognized through entrepreneurship support programs, but the document doesn't specify measures to support women, beyond the broader tourism development goals. Montenegro's Rural Tourism Development Program 2023-2025 recognizes that women in Montenegro are the backbone of agrotourism services and defines a number of priorities, including strengthening rural sustainable entrepreneurship, with accompanying measures stipulating the supportive activities for women and youth. To promote women's entrepreneurship in rural tourism, the Ministry of Tourism is running the "Rural, Homemade" campaign. This campaign includes a competition with prizes and promotes the economic empowerment of women in the tourism sector. Two key support lines have been defined within the campaign: an award for the best hostess and an award for the best rural household establishment, providing further incentives for engagement of women in rural areas. Additionally, in the 2024 Action Plan, the campaign was recognized as part of the measure "Encouraging Entrepreneurship (family business, women, youth)," which emphasized its strategic importance. Through its Incentive Measures Program, the Ministry of Tourism not only strives to improve the quality and diversity of the tourism offer but also actively supports the development of women's businesses. In 2024, 26 women received financial support, accounting for 25% of the total number of applicants. This confirms the continuous trend of encouraging women's entrepreneurship and strengthening their role in the development of rural tourism.

The National Tourist Organization (NTO), NGOs and international organizations conducted several successful projects that support engagement of women in development of rural tourism. For example, the project "Katun Roads of Montenegro and Bosnia and Herzegovina"[27], that targeted women in katuns and communities in the cross-border area. The other positive examples include donor-financed programs conducted by NGOs for the development of rural tourism in the areas of Bjelasica, Komovi and Prokletije, as well as the programs for economic empowerment of Roma women in Herceg Novi through development of their jewellery crafting skills. The Investment and Development Fund of Montenegro provides finance through banks and directly to small and medium businesses led by women through several support program-based initiatives. At the local level, an increasing number of municipalities provide financial and non-financial support to women entrepreneurs. This is a positive trend that should be further improved and expanded.

3.7.4. Gender considerations in Montenegro's health sector

The 2021 Health Care Law contains several articles that are important for adaptation, including priority health care measures related to environmental pollution for children, people over the age of 65, women, as well as people with disabilities and persons on dialysis. Also, the Health System Adaptation Program to Climate Change recognizes pregnant women, children and elderly people as the most vulnerable groups. Furthermore, individuals suffering from chronic diseases, rare disease, cancer etc. are vulnerable groups, whose protection should be taken into consideration. The Centre for Health Promotion and the Institute of Public Health have had gender equality in the focus in the last 10 years. The work plan of the Centre for 2022 contains activities related to participation and monitoring the implementation of the goals defined in the National Strategy for Gender Equality 2021-2025.

[27] Katun is a local name for settlements in the mountains, where the local people - cattle breeders, spend summer season with their livestock.

The health sector is, along with social care and education, a profession with the highest concentration of women. In 2020, in public hospitals and other public health institutions, out of 1,721 physicians, 1,095 were women (63,62%). Out of 1,721 physicians, there were 1,151 specialists, and 62,38% of them were women[28]. Also, women make the majority among other health workers - nurses, health cleaning services, etc. Data related to the percentage of women in private health institutions are not available.

3.8. Stakeholder analysis

There are several government directorates, departments, and institutions involved in addressing the consequences of the climate crisis that Montenegro is facing. The key institutions, the categorization of parties in relation to their interest and influence (power) are described in detail in Table 3.1 below.

Table 3.1 Categorization of parties in relation to their interest and influence (power)

Stakeholder	Relation to the strategic document	Interest	Influence/Power
Ministry of Ecology, Sustainable Development and Northern Region Development (Directorate for Climate Change and Sustainable Development)	Responsible for the adoption, implementation, and monitoring of climate change policy. The Directorate for Climate Change is the UNFCCC contact point.	5	5
Ministry of Health	The Ministry of Health continuously monitors the health situation and takes appropriate measures to prevent and control health problems and support community initiatives and activities related to health, which is crucial for reducing negative impact of climate change. The Ministry deals with strategic planning of the healthcare and health insurance systems and monitors their operation and development. It also analyses key indicators of the population's health status, paying special attention to the protection of vulnerable and at-risk groups. It focuses on improving the health status and identifying the health needs of the population, encourages the strengthening of public health, and prepares plans and projects in the field of program-based healthcare.	5	5
Environmental Protection Agency	Operates under the Ministry of Ecology, Sustainable Development, and Northern Region Development and plays an important role in preparing the GHG emission inventory.	4	4
Institute for Hydrometeorology and Seismology	The IHMS is a state administration body responsible for numerous tasks in the fields of meteorology, climatology, hydrology, hydrography, oceanography, and seismology. It also manages meteorological and hydrological observation and forecasting systems all over Montenegro. Furthermore, the IHMS monitors climate change, including extreme weather and climate events such as droughts, heatwaves, heavy rainfall, and storms. The IHMS is the focal point for the Intergovernmental Panel on Climate Change (IPCC).	5	5
Environmental Protection Fund (Eco-fund)	Established in 2020, it finances the design, implementation, and development of programs and projects related to the conservation, sustainable use, protection, and improvement of the environment, as well as energy efficiency and the use of renewable energy sources at both the national and local levels.	3	3
Ministry of Economic Development	Responsible for the policies in the field of energy and industry.	3	3

[28] Data received from the Institute for Public Health in May 2022, for the purpose of this analysis

Ministry of Agriculture, Forestry and Water Management	The MAFWM is the state authority responsible for water management, forestry, fisheries, and hunting. The Directorate for Water Management (DWM) is a public administration unit within the MAFWM responsible for implementing the water management policy in Montenegro, in line with the principles of managing water, coastal land, and water installations. The DWM directs its measures and actions toward water use while ensuring the long-term protection of water quality and sources. It takes measures to protect water from pollution, regulate water and watercourses, and protect against the harmful consequences caused by water.	5	5
Ministry of Tourism	The Ministry of Tourism in Montenegro is responsible for designing and implementing policies for the development of tourism and hospitality, including planning and implementing strategies for the sustainable development of the sector. Its competencies include issuing licenses to travel agencies, guides, and other entities, maintaining the Central Tourism Register, prescribing minimum technical requirements for buildings and services, and overseeing the implementation of laws. The Ministry also adopts regulations on quality standards, tourist signage, and the protection of tourists' rights and simultaneously encourages the digitalization of the sector and adaptation to climate change through sustainable practices. Through inspection oversight and collaboration with the private sector, it contributes to the improvement of the competitiveness of tourism and promotion of Montenegro as an attractive tourist destination.	5	5
Water Administration	Water Administration implements activities aimed at protection against harmful effects of water (floods), with a special focus on measures and works to regulate water and watercourses. It also manages water facilities for protection against the harmful effects of water, establishes and maintains a water information system, water cadastres, and a register of waters of significance for Montenegro. By monitoring natural and other events, it collects data that is crucial for protection against harmful effects of water.	4	4
Ministry of Interior (Directorate for Protection and Rescue)	The role of the Ministry of Interior in disaster risk reduction is to ensure timely, high-quality, and proper planning, preparation, and implementation of measures for the protection and rescue of citizens, material and cultural assets, and the environment. The Ministry serves as the focal point for communication and a range of activities conducted in cooperation with the United Nations Office for Disaster Risk Reduction for Europe and Central Asia (UNDRR). It is the focal point for the implementation of the Sendai Framework for Disaster Risk Reduction and coordinates joint activities that are part of bilateral and multilateral cooperation with international actors, domestic institutions, and non-governmental organizations. It also coordinates cooperation and participation in the activities of the EU Civil Protection Mechanism and NATO in the field of protection, rescue, and disaster risk reduction. The Ministry coordinates the preparation and implementation of disaster risk reduction programs and projects, as well as the development of strategic documents and national planning documentation in the area of protection and rescue with other ministries, state administration bodies, municipalities, and non-governmental and international organizations.	5	5
National Council for Sustainable Development (2022)	Responsible for the development, monitoring, and implementation of national policies on sustainable development and climate change. It is also involved in planning and aligning development policies with the requirements of sustainable development and climate change, as well as in implementing the European Union's sustainable development framework within the Energy and Climate Package. The Council's working groups cover the following areas: • Monitoring and implementation of the sustainable development policy; • Adaptation to and mitigation of climate change; • Just transition; • Integrated coastal zone management; • Sustainable development at the local level; • Financing for sustainable development.	5	5

Working Group for Mitigation and Adaptation to Climate Change (NCSD working group)	Provides support and guidelines for national climate policy regarding the implementation of mitigation and adaptation measures to combat the harmful effects of climate change. The working group is an interdepartmental body composed of representatives from all relevant authorities, civil society, employer associations, and the academic community.	5	5
Water Administration (Department for Water Inspectorate)	The Department for Water Inspectorate is responsible for: inspecting the application of laws, bylaws, and other regulations in the field of water management; taking and enforcing administrative and other measures to correct identified irregularities; ensuring compliance with regulations; issuing misdemeanour orders; filing requests to initiate misdemeanour proceedings; filing criminal and other charges (initiating proceedings with competent authorities); proposing initiatives to amend laws, other regulations, and general acts; proposing measures to improve the situation in the area of supervision; preparing analyses, reports, and information related to the department's scope of work; coordinating the establishment and implementation of risk management processes within the department; encouraging cooperation with other administrative bodies, institutions, and economic entities; and for performing other duties within the department's mandate.	3	3

4. Plan’s vision, sectoral strategic and operational objectives and measures

As explained in detail in the introduction, the vision, objectives, and measures of the CCAP were developed through a process that included extensive consultations with representatives of relevant institutions, the non-governmental sector, the expert community, and other stakeholders. At the same time, this process was based on a detailed analysis of existing national and sectoral strategic and planning documents, which ensured the alignment of CCAP with Montenegro's already defined development directions and policies.

The CCAP vision and goals are formulated to be integrated into a broader, iterative process of building the country's resilience to climate change. The plan is not viewed as an isolated document, but as a tool that contributes to the harmonization and strengthening of existing sectoral policies and institutional capacities. This is particularly evident in the selection of adaptation measures presented in this chapter.

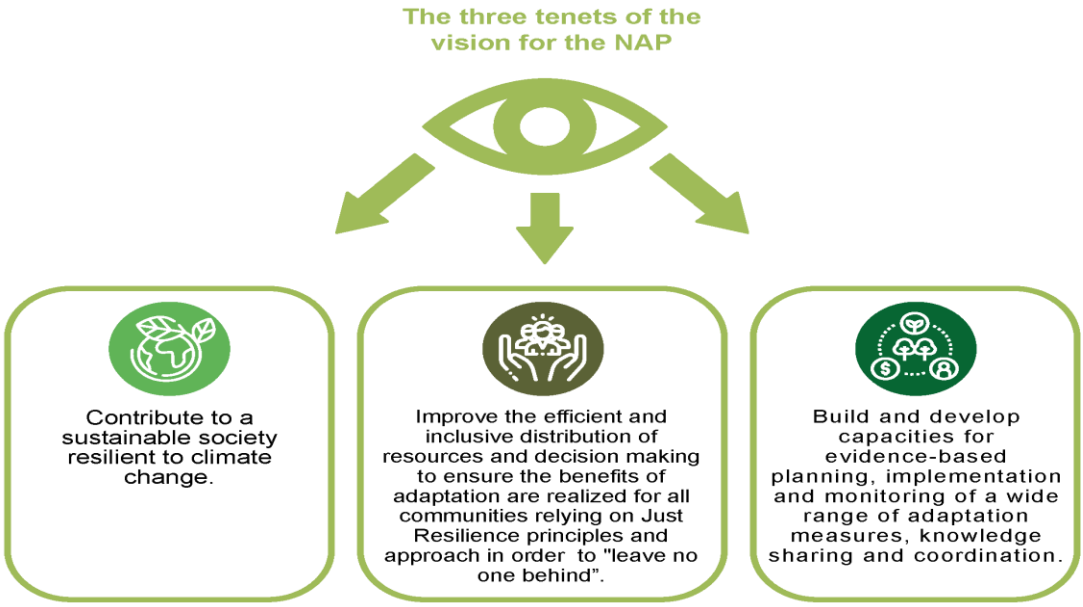
In each sector, initial steps toward climate change adaptation are already underway, and many sectors have begun to identify specific needs and opportunities that can be translated into operational measures. During the preparation of the CCAP, all such measures were identified and analysed. Through a participatory approach and multi-criteria analysis, a short list of measures was selected. From this list four priority measures were identified for each sector, as well as for the cross-section area, and they will be in the focus of action in the coming period.

For each "high-priority" measure, described in detail in Chapter 5, in the Appendix B: Priority Adaptation Measures, a project sheet is provided with extensive details about the measure, including: implementation steps, timeline, relevant stakeholders, costs, and financing mechanisms. This information was prepared to provide the entities responsible for the measure with a detailed guide to assist them in their implementation.

4.1. CCAP vision

A comprehensive vision for the CCAP provides a clear direction and purpose, guiding actions towards resilience. This vision aligns measures with operational objectives by ensuring that each step contributes to the overarching goal of climate adaptation. By connecting operational objectives to

strategic objectives, the plan gains strategic coherence, fostering efficient resource allocation and prioritization. Ultimately, these strategic objectives collectively serve the vision, reinforcing its significance and demonstrating tangible progress towards a climate-resilient future for Montenegro. In essence, the vision acts as a guiding path from individual measures to overarching objectives.



4.2. Sectoral objectives and measures

4.2.1. Agriculture: Objectives and measures

Key
ASO – Agriculture Strategic Objective
AOO – Agriculture Operational Objective
A – Agriculture Adaptation Measure

High priority adaptation measure
Medium priority adaptation measure
Lower priority adaptation measure

Strategic Objective	Operational Objective.	Adaptation Measure
ASO 1. Gathering of high-resolution expert data and integration of local knowledge for the improved intersectoral planning and evidence-based prognosis	AOO 1.1. Establish an inclusive planning framework for just resilience.	A1.1.1. Defining and enhancing the rural development policy, designing a women-led plan for climate resilient food production, and promote the participation of women in decision-making bodies.
		A1.1.2. Improve integration of sectoral policies at national level by the government, to support implementation of EU legislation e.g. EU Water Framework Directive.
	AOO 1.2. Enable informed decision making through monitoring and data collection, storage and sharing.	A1.2.1. Capacity building of the agro-meteorological services, including improving the monitoring network and reporting and dissemination of information.
		A1.2.2. Continue and expand the monitoring of marine areas (more fishermen and larger areas) to help assess and reduce vulnerabilities e.g. invasive sea species, pollution.
		A1.2.3. Implementation of models for simulating crop yields and predicting plant diseases and improve the phenological database, supported with a data collection and management system.
		A1.2.4. Promoting the knowledge base of autochthonous and adaptable varieties and breeds and to establish AKIS (Agriculture Knowledge and Information System) with training program for farmers. Supported by a variety testing program for different regions to ensure farmers can grow resilient crops.
ASO 2. Capacity building on climate change	AOO 2.1. Raise capacities of farmers to adapt to climate change.	A2.1.1. Raise capacities and awareness on combined production practices.
		A2.1.2. Establishment of clusters, networks, associations of agricultural producers, to share knowledge and examples of good practice to strengthen resilience against climate change and other challenges.

adaptation in order to provide a resilient food production system.	AOO 2.2. Improve financing for climate change adaptation	A2.2.1. Establishing financial incentives for water supply (wells, reservoirs), irrigation systems and soil management within agro-budget and conduct analysis to inform the incentives and opportunities, defining subsidies and adoption of appropriate regulations.
ASO 3. Designing and implementing adaptive agriculture practices and measures resulting in maintenance of yields, diversification, soil, water and ecosystem services preservation.	AOO 3.1. Ensure minimal losses of yields through implementation of adequate technical measures.	A3.1.1. Enhancing the application of climate-smart agrotechnical measures.
		A3.1.2. Identifying and implementing measures to reduce climate stress on livestock.
		A3.1.3. Implement Irrigation infrastructure for drought resilience.
	AOO 3.2. Prevent degradation of natural base of food production system.	A3.2.1. Preservation of hay meadows and pastures and the promotion of sustainable land use practices.
		A3.2.2. Improve, strengthen the enforcement and training of good agricultural practices and nitrate directive to ensure polluter pay, to include soil conservation water use and biodiversity conservation practice.
		A3.2.3. Developing and promoting Agro-forestry projects e.g. new plantations of hazelnut, wild pomegranates and other suitable species in degraded and fire prone areas, also supporting development of forests on private lands.
		A3.2.4. Program control catches to reduce the numbers of new or expanding marine species in the Adriatic.

For each 'High Priority' measure (in green), an overview is given in **Appendix A: Action Plan 2025-2027**, while **Appendix B** includes a project sheet with extensive details about each measure, including: the steps to implementation, timeline, relevant stakeholders, and financing mechanisms.

4.2.2. Water: objectives and measures

Key
WSO – Water Strategic Objective
WOO – Water Operational Objective
W – Water Adaptation Measure

High priority adaptation measure
Medium priority adaptation measure
Lower priority adaptation measure

Strategic Objective	Operational Objective	Adaptation Measure
WSO 1. Improved knowledge base of water resources providing a foundation for capacity building and coordinated intersectoral water management approaches.	WOO 1.1. Ensure the up-to-date high-resolution data as a basis for informed decision making	W1.1.1. Strengthen the network of measuring stations and improve the monitoring of water related data
		W1.1.2. Upgrading of flood risk mapping and interventions that prioritize Natural Water Retention measures
		W1.1.3. Develop Water Cadaster/Water Management System, for Surface and Ground Water. Including the update of existing data, improvement of data management (using GIS tools) and integration into the Water management information system. Including the development of intersectoral water management system, which includes intersectoral coordination on data sharing and use
	WOO 1.2. Ensure coordinated intersectoral water management	W1.2.1. Develop an intersectoral Coastal Plan, with focus on vulnerable coastal areas. To be a case study of Montenegro capacities to manage areas highly sensitive to climate change e.g Ada Bojana, Ulcinj Salina
WSO 2. Improved capacities for preparation and response to extreme hydrological weather events to reduce injury,	WSO 2.1. Build capacities for integration of climate risks into planning	W2.1.1. Improve capacities of policy makers and strengthen the research and management capacities. To assess the occurrence and risk of adverse impacts of climate change and adaptation of freshwater systems.
		W2.1.2. Develop new methodologies and design watershed protection zone projects at all water sources integrating climate change aspects
	WOO 2.2. Raise preparedness of the general public for	W2.2.1. Implement educational campaigns for general population on water resources, climate impacts and the need for their preservation and protection

deaths and infrastructure damages.	adverse effects of climate change	
	WOO 2.3. Mainstream nature-based solutions for reducing climate risks	W2.3.1. Supporting and establishing coastal and inland aquatic ecosystems (seagrass fields, coastal wetlands, reconnecting floodplains and rivers etc.) along key areas of the coast. Delivering programs and ensuring these ecosystems are embedded in plans and policies.
WSO 3. Improved resilience of water supply system to climate change ensuring the availability of drinking water to all population groups	WOO 3.1. Improve the water supply system capacities for the delivery of sufficient water quantities	W3.1.1. Technical and organizational improvements at enterprises which manage water supply e.g. (measuring equipment, reducing illegal connections). Improving the efficiency and cost-effectiveness of water services (reducing network leakage through sound maintenance and renewal of assets, water pricing initiatives)
		W3.1.2. Upgrade and ex tend the existing water and utility infrastructure of the system to: 1) reduce losses 2) provide access to water to vulnerable groups and rural population, 3) improve the climate resilience of the system 4) modify extraction methods to accommodate lower flow of water levels 5) Protection of Sanitary Zones of Water Sources
		W3.1.3. Explore options for diversifying water supply especially in the coastal areas e.g. desalinization, rainwater harvesting
	WOO 3.2. Ensure suitable water quality during climate hazards	W3.2.1. Improvements in waste and wastewater management

For each 'High Priority' measure (in green), an overview is given in **Appendix A: Action Plan 2025-2027**, while **Appendix B** includes a project sheet with extensive details about each measure, including: the steps to implementation, timeline, relevant stakeholders, and financing mechanisms.

4.2.3. Health: objectives and measures

Key
HSO - Health Strategic Objective
HOO - Health Operational Objective
H – Adaptation Measure

High priority adaptation measure
Medium priority adaptation measure
Lower priority adaptation measure

Strategic Objective	Operational Objective	Adaptation Measure
HSO 1. Improved human and technical capacities of the health sector to provide timely planning and response to climate hazards, with a particular focus on marginalized groups.	HOO 1.1 Enhance preparedness of the sector to climate change through development of processes and systems	H1.1.1 Improve the preparedness of staff, facilities and systems in the health sector for climate hazards, through training, climate risk assessments and specific interventions.
		H1.1.2 Include and define health sector's role in hazard preparedness and response in the national and local level readiness plans
		H1.1.3 Introduce an early warning system to prepare the health sector for appropriate response during the weather extremes, supported by training programs to enhance knowledge and skills of the workforce in the health care facilities
	HOO 1.2 Improved capacity of healthcare providers to reduce vulnerabilities to climate change	H1.2.1 Improve working conditions for healthcare workers and improve capacity and staff levels in rural areas to reduce regional disparity in healthcare and vulnerability to climate change
		H1.2.2 Provide the health care system in the country with essential medical products, service delivery, technologies, and health care infrastructure for climate adaptation and resilience
HSO 2. High-resolution data collection and management for evidence-based	HOO 2.1 Support research into health sector and climate change	H2.1.1 Strengthen the capacity of researchers working on infectious diseases by incorporating an intersectional gender approach
		H2.1.2 Conduct field research on homelessness and health In line with the legal framework on social housing and National Housing Strategy

planning and evaluating specific vulnerabilities leading to targeted adaptation measures.		H2.1.3 Defining and implementing priority research in areas (such as vector borne diseases, impacts of heat waves)
	HOO 2.2 Support data collection and management into health sector and climate change	H2.2.1 Setting up procedures, legal and institutional mechanisms for systematic collection of data for digitalization of health sector and data management including on: healthcare statistics, new and prospective diseases, climate change related hazards and ensuring sex disaggregated data, with sufficient training of staff on digitalization and collecting data
HSO 3. Improved public awareness, particularly for vulnerable groups, to reduce the health-related impacts of climate change.	HOO 3.1 Implement public preparedness and awareness campaigns and measures	H3.1.1 Development and promotion of education, awareness raisisng and general guidelines and support of facilities for the population during heat waves and extremes.
		H3.1.2 Introduce evidence-based heat wave protection action plans and implement selected pilot projects in Podgorica and Danilovgrad
	HO 3.2 Develop a legislative framework for gender sensitive climate action in the health sector	H3.2.1 Develop a Long-Term Strategy on Climate Action in Health Sector which is in line with the EU requirements and prospects for climate action until 2050.
		H3.2.2 Define, legally regulate and institutionalize the national climate adaptation planning processes for health sector

For each 'High Priority' measure (in green), an overview is given in **Appendix A: Action Plan 2025-2027**, while **Appendix B** includes a project sheet with extensive details about each measure, including: the steps to implementation, timeline, relevant stakeholders, and financing mechanisms.

4.2.4. Tourism: Objectives and measures

Key
TSO - Tourism Strategic Objective
TOO - Tourism Operational Objective
T - Tourism Adaptation Measure

High priority adaptation measure
Medium priority adaptation measure
Lower priority adaptation measure

Strategic Objective	Operational Objective	Adaptation Measure
TSO 1. Training and capacity building for all relevant stakeholders in the tourism sector to improve know-how and skills for the transformation of the tourism sector in the face of climate change and for obtaining support on implementing the adaptation activities.	TOO 1.1 Implementation of a diverse tourism offer to enhance resilience of the sector	T1.1.1 Developing Community-Based Tourism Programs as a strategy for building climate Resilience e.g. promoting rural, agro and eco-tourism and other high value, low impact tourism products.
	TOO 1.2 Identify and develop funding opportunities to enhance transformation of the sector	T1.2.1 Incentivizing the growth and development of green/ sustainable tourism and promote private sector adaptation measures. Including the development of national and local Business Development Services for sustainable tourism, such as access to information, markets, training and exchange of experience
		T1.2.2 Providing financial and non-financial support to tourism-based communities who are vulnerable to climate change to help diversify and adapt to climate change, with sustainable tourism offer
		T1.2.3 Improve funding opportunities to facilitate research and innovation into sustainable tourism practices and how they could be implemented more widely

TSO 2. Improve the understanding of tourism vulnerabilities to the impacts of climate change through monitoring, research and integration with data providers to build resilience and adaptive capacity of the industry.	TOO 2.1 Improve knowledge base to implement technical measures	T2.1.1 Introduce technical measures to build resilience for tourism businesses e.g. retrofit buildings, shading outdoor areas, enhance key transport infrastructure to be climate resilience
	TOO 2.2 Use data to support policy initiatives to provide enabling environment for diversification	T2.2.1 Identify key Indicators and Data to Analyze and Monitor changes in tourism, developing and implementing plans to adapt the tourist sector, and support evidence-based policy and planning
		T2.2.2 Conduct a detailed sensitivity and exposure assessment of tourism assets using gender sensitive data, to also support diversification of tourism offer
TSO 3. Establishing/strengthening multi-sector coordinated approaches and mechanisms to strengthen preparedness for early warning and planning for climate change.	TOO 3.1 Improve coordination between climate services and tourism sector to strengthen preparedness	T3.1.1 Upgrade early warning systems for tourism business and users and implement awareness program
		T3.1.2 Improve the cooperation and integration of the tourism sector with climate services
	TOO 3.2 Develop a legislative framework for gender sensitive climate action in the tourism sector	T3.2.1 Develop legislation to ensure commitments made by signing international agreements on climate action in tourism are embedded in policy
		T3.2.2 Gender responsive coherence, governance and operational procedures in the tourism sector

For each 'High Priority' measure (in green), an overview is given in **Appendix A: Action Plan 2025-2027**, while **Appendix B** includes a project sheet with extensive details about each measure, including: the steps to implementation, timeline, relevant stakeholders, and financing mechanisms.

4.2.5. Cross cutting objectives and measures

Key
CCSO – Cross-Cutting Strategic Objective
CCOO – Cross-Cutting Operational Objective
CC – Cross-Cutting Adaptation Measure

High priority adaptation measure
Medium priority adaptation measure
Lower priority adaptation measure

Strategic Objective	Operational Objective	Adaptation Measure
CCSO 1. Support gender and vulnerable groups through collection and monitoring of disaggregated data.	CCOO 1.1 Collection of disaggregated data	CC1.1.1 Create robust procedures for data collection, monitoring and reporting across sectors, with a data management database to ensure availability of data for planning, policy and programming
CCSO 2. Ensure integration of gender and equity considerations in intersectoral programmes, policies and initiatives	CCOO 2.1 Improve inter-sectoral collaboration to tackle climate change in a just and equitable way	CC2.1.1 Inter-sectoral programming to integrate Agriculture, Tourism, Health and Water Sectors planning, with a shared flagship program tackling climate risks across the sectors
		CC2.1.2 Improve communication structures between the scientific/ research community, public institutions responsible for planning, and the commercial sector and establish an intersectoral body and processes regarding climate change e.g. NCSD to arrange two round-table workshops for each key sector, each year, to discuss the nexus between policy, research, business, programming for each sector with regards to climate change
		CC2.1.3 Establish an intersectoral body and process to monitor the impact of climate change

		CC2.1.4 Educational Programs in schools, higher education (University/LLLs), and relevant sectoral institutions, that raise levels of awareness, capacity and preparedness of climate change and its impact
	CCOO 2.2 Develop a legislative framework for gender sensitive climate	CC2.2.1 Mainstream climate change adaptation into specific regulations and policies
		CC2.2.2 Make amendments to the applicable legislation and develop policy and secure implementation in the field of spatial planning in order to include climate change impacts in preparation of spatial planning documentation and technical design.
CCSO 3. Ensure the planning and implementation of adaptation measures includes representation and distribution of benefits to vulnerable groups	CCOO 3.1 Embed gender, equity and social inclusion considerations in preparedness activities	CC3.1.1 Development and implementation of gender responsive and social inclusive local disaster and climate resilience plans, and establishment of gender and social inclusive sensitive early warning systems
	CCOO 3.2 Improve representation of vulnerable groups in adaptations structures	CC3.2.1 Suite of gender responsive actions to empower women in all key sectors and embed gender in cross-sectorial and coherent policies: 1. Organize series of training workshops (basic and advanced) on gender mainstreaming 2. Develop and give mandate to a cross-sectoral women's group to ensure gender sensitivity across adaptation actions across the sectors. (Engage Women NGOs, UNFCCC and Gender Focal Points, Gender network and Parliamentarian Commissions to promote leadership roles for women in climate action) 3. Prepare informative and engaging materials to increase understanding of climate & gender nexus on local level 4. Involve underrepresented groups in NAP implementation through creating community consultancy groups 5. Collect sex-disaggregated data and use it in monitoring of NAP and other action plans to ensure inequality is reducing

For each 'High Priority' measure (in green), an overview is given in **Appendix A: Action Plan 2025-2027**, while **Appendix B** includes a project sheet with extensive details about each measure, including: the steps to implementation, timeline, relevant stakeholders, and financing mechanisms.

5. Mechanisms and framework for monitoring and evaluation (M&E) during the implementation of CCAP

Climate change adaptation is a dynamic and continuous process that requires monitoring, learning and flexibility to effectively manage climate risks, in line with growing negative impacts, new knowledge and data, and social, economic and political changes. In response to these dynamics, a monitoring and evaluation system is an essential tool to ensure that CCAP processes are flexible and accountable.

This system is designed to monitor progress, evaluate the results and implementation of CCAP activities, as well as to support the learning process to accelerate the achievement of planned adaptation goals. Therefore, the system includes mechanisms for gathering lessons learned and enables continuous learning. The CCAP audit processes are thus based on concrete and useful insights gained during the implementation of the measures.

This means that the M&E system consists of three, albeit different, interconnected and compatible components:

Monitoring: Systematic and continuous performance monitoring, which makes immediate identification of problems and challenges, as well as successes, possible. The result is comprehensive information that can be used to understand use of resources and decision making.

Evaluation: Periodic performance assessment in terms of the outcome and impact of the CCAP processes, carried out at strategic moments. Evaluations rely on the results of the monitoring system,

but are complemented by additional sources. They provide a detailed analysis of specific performance criteria.

Learning: Learning in the context of the CCAP processes implies a collective and planned effort to gain, evaluate and share new knowledge. This leads to changes or enhancement of understandings, attitudes and actions regarding climate change adaptation.

5.1. Gender equality, fairness and inclusion in M&E

Mainstreaming gender equality and social inclusion into CCAP processes is essential to ensure the effectiveness, relevance and sustainability of climate change adaptation and development initiatives. The impacts of climate change are unevenly distributed across society, affecting certain groups significantly more than others. There is a risk that some of these impacts will further exacerbate existing inequalities. People facing discrimination tend to be more vulnerable to climate impacts and have limited access to adaptation decision-making processes. However, their involvement in these processes can open a dialogue for access to key knowledge that will inform adaptation actions.

Gender equality and inclusion are an essential focus of the Montenegrin CCAP, and the M&E system has been developed to strengthen the inclusive nature of adaptation planning in Montenegro.

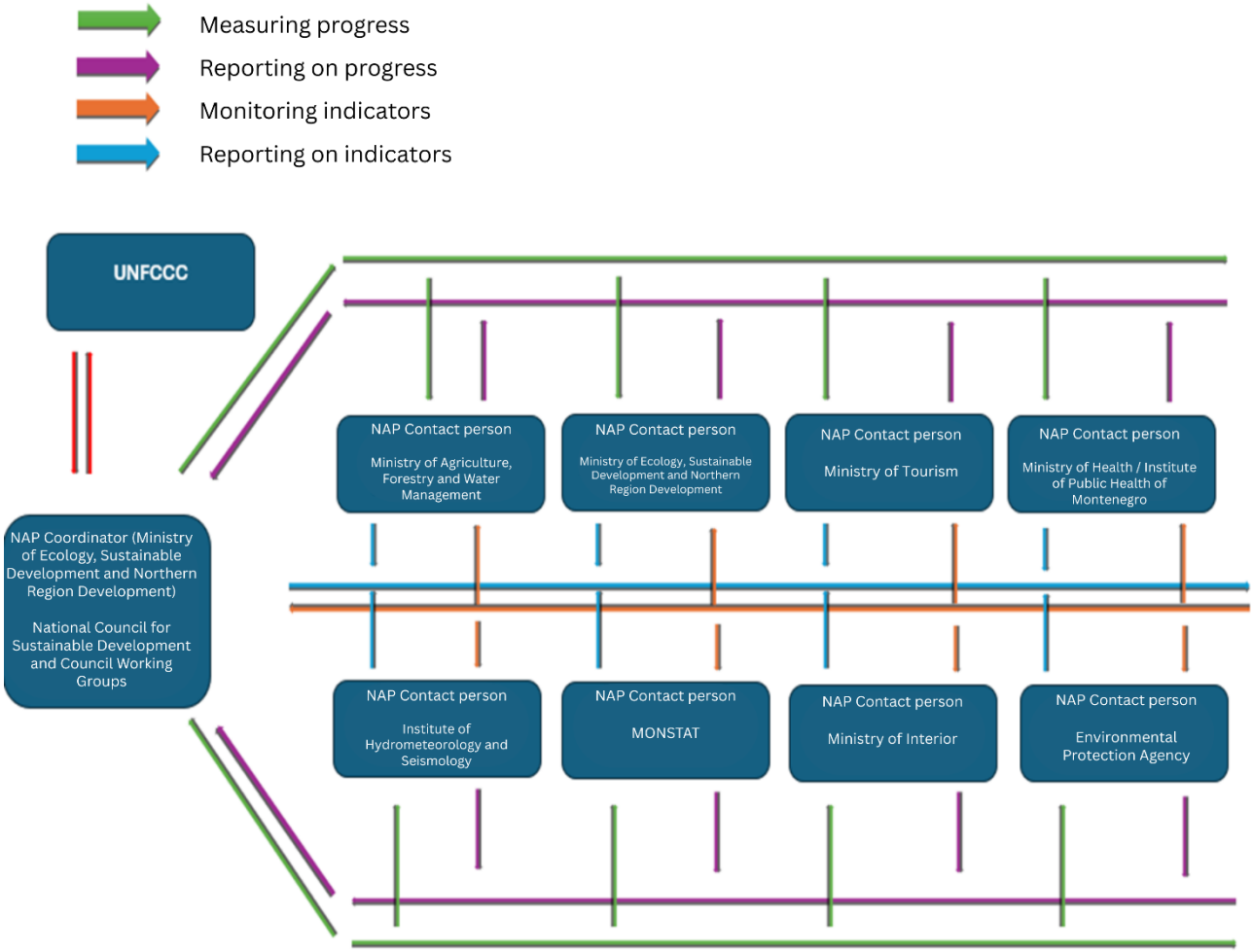
5.2. Institutional roles and responsibilities

The collective and planned effort within the M&E system for CCAP processes involves acquiring, evaluating and sharing new knowledge. This approach allows for continuous adaptation and improvement of strategies, leading to changes or enhancement of understandings, attitudes and activities related to climate change adaptation. Systematic data collection and analysis provide the basis for making informed decisions and identifying best practices. Through cooperation of different institutions and sectors, a platform is created for the exchange of experiences and lessons learned from the implementation of adaptation measures. The M&E system thus contributes to a more effective response to the challenges of climate change and ensures that CCAP stays relevant and aligned with current needs and changes in the environment and social and economic setting.

The proposed Climate Change Law specifies the obligations of institutions to provide timely data. Specifically, it prescribes the obligations of state administration authorities, local self-governments and public institutions responsible for hydrometeorology, environmental protection, disaster risk reduction, statistics, agriculture, fisheries, forestry, waste management, water management, energy, industry, transport, infrastructure, spatial planning, nature protection, maritime, tourism and health. These institutions are required to collect and/or maintain data on activities in sectors where greenhouse gases are emitted or removed, as well as on climate change mitigation measures, GHG emission projections and climate change adaptation measures. All information related to these activities must be submitted to the Ministry without delay and free of charge (more details on this article of the law can be found in the Legal Obligations section below).

The illustration of the monitoring and reporting flows below shows that the roles and responsibilities of different ministries and organizations are critical to the success of this M&E system:

Figure 5.1. – Institutional arrangement of stakeholders involved in CCAP monitoring and management



Note: The institutional structure shows the key stakeholders involved in the continuous monitoring and management of the CCAP. Other important stakeholders include the Biotechnical Faculty, the National Tourism Organization, the Union of Municipalities, as well as the Ski Resorts of Montenegro, the National Parks of Montenegro, the Coastal Zone Management Company and other managers of protected areas, the Marine Biology Institute that may also be involved in data collection and monitoring.

Key ministries and organizations are responsible for several framework indicators or for entire sectors and their roles are clearly defined.

Each of the institutions mentioned below appoints a CCAP coordinator who will have the role of a CCAP focal point. Ideally, the CCAP coordinator is the same person appointed as a member in the NCSD working group dealing with climate change issues. The coordinators for CCAP and NCSD thus have the role of supporting the following institutions:

The Ministry of Ecology, Sustainable Development and Northern Region Development is the key institution responsible for CCAP implementation and coordination. Its role includes overseeing the entire monitoring and evaluation (M&E) process, as well as ensuring that all relevant data is effectively collected, analysed and used for reporting. The Ministry coordinates cooperation with other institutions in order to collect data related to climate change adaptation, with responsibility for ensuring the accuracy, timeliness and comprehensiveness of such data. Also, the Ministry plays a significant role in reporting to the UNFCCC, which implies compilation and submission of reports on progress in the CCAP implementation to relevant international and domestic institutions.

The Institute of Hydrometeorology and Seismology is responsible for collecting, analysing and comparing data and forecasts in the fields of meteorology, climatology, hydrology, hydrography and seismology. This includes information on temperature, precipitation, extreme weather and climate events, as well as data on water regimes and seismic activity. The Institute monitors climate change,

assesses its impacts and vulnerabilities, and provides relevant forecasts and analyses that are crucial for planning and implementing adaptation measures.

The Ministry of Interior plays a key role in creating disaster risk reduction policies and responding to various hazards caused by climate change, such as floods, fires, extreme weather events, etc. This Ministry assesses the risks associated with climate change and coordinates with other institutions to analyze data and improve adaptation measures. In cooperation with the competent institutions, the Ministry of Interior, prepares the Disaster Risk Assessment of Montenegro and the Disaster Risk Management Capability Assessment of Montenegro, and drafts and proposes adoption of a strategic document in the field of disaster risk reduction to the Government, i.e. the Strategy for Disaster Risk Reduction 2025-2030 with the Action Plan 2025-2026, and plays an important role in climate change policymaking.

The Environmental Protection Agency monitors various environmental parameters and assesses the impacts of climate change on ecosystems and biodiversity. Its role is crucial to understand changes in natural habitats and conserve the biodiversity.

The Statistical Administration of Montenegro (MONSTAT) collects and analyses statistical data relevant for climate change adaptation, including social and economic data, tourism-related statistics and data from agriculture. MONSTAT integrates climate data into national statistical reports and ensures their availability for policy-making and planning purposes.

The Ministry of Health monitors the impacts of climate change on health, including increased incidence of heatwave-related illnesses, vector-borne diseases, as well as respiratory problems caused by air pollution. The Ministry is responsible for implementing and overseeing preventive measures to protect public health, including awareness-raising campaigns and programs to strengthen the resilience of the health system to climate change.

The Institute for Public Health of Montenegro researches and monitors the effects of climate change on the population's health. It analyses the data on the incidence and prevalence of diseases induced by climate change and makes recommendations to improve health policies and practices. The institute also plays an important role in raising awareness of the public about the health risks of climate change, through information campaigns and materials.

The Ministry of Agriculture, Forestry and Water Management is responsible for implementing and monitoring adaptation measures in the agricultural sector, including crop adaptation, water resource management, and soil protection. It also monitors changes in agriculture caused by climate change, such as the movement of crops, orchards and vineyards to higher altitudes, to ensure the sustainability of agricultural production in the new climate conditions.

5.3. Integrated system for monitoring and evaluation in the field of climate change

The results of CCAP monitoring can be complementary to other planning agendas and activities of the Government of Montenegro. The indicators for Montenegro's first CCAP were selected after reviewing existing datasets and monitoring capacities to determine which of them are already being collected for existing international frameworks and agreements, for example, the Sustainable Development Goals (SDGs), in order to accomplish maximum efficiency in data collection and analysis.

The process relies on:

1. *Data collection:* Each institution collects relevant data from its field of activity, including data on climate parameters, health effects, weather events, agricultural practices, tourism characteristics

and preventive measures. For each indicator, the institution responsible for collecting data to support the monitoring of that indicator has been identified.

2. *Data entry and analysis:* The collected data are entered into a centralized system that makes their analysis and visualization possible.
3. *Reporting:* The institutions regularly report to the Ministry of Ecology, Sustainable Development and Northern Region Development on the data collected and the analyses carried out.
4. *Evaluation***:** Based on the collected and analyzed data, the effectiveness of measures and strategies is assessed.
5. *Coordination and modifications:* The results of evaluations are used to modify, revise and improve adaptation measures under the CCAP. The institutions coordinate their activities and cooperate on the implementation of new or revised measures.

This process ensures an effective and coordinated response to climate change risks and makes it possible for the CCAP to remain dynamic and adaptable to the needs and challenges that Montenegro is facing.

5.4. Legal obligation

The key documents governing the M&E process include:

- Regulation on the method and procedure of drafting, harmonizing and monitoring the implementation of strategic documents (Official Gazette of Montenegro 54/2018);
- Methodology for policy development, preparation and monitoring of the Implementation of strategic documents (General Secretariat of the Government);
- Manual for the evaluation of strategic documents (General Secretariat of the Government);
- The proposal of the Climate Change Law, which is in the process of being adopted. The proposed Climate Change Law inlcudes solutions that improve the mechanisms of implementation, as well as the process of monitoring and reporting on the CCAP, which will become binding on the day of adoption.

Key provisions of the Law:

- **Article 43** introduces the obligation to monitor and report on climate change adaptation measures.
- **Article 49** details the obligation to report on the implementation of the Climate Change Adaptation Plan. It also introduces the obligation to draft a special bylaw that will govern the methodology and process of monitoring and reporting. The text of the Law, i.e. the same article also includes the obligation to engage the Working Group on Climate Change Mitigation and Adaptation in the preparation of the report, in addition to the Ministry.
- **Article 50** defines the obligations of institutions to submit data in line with the deadlines.
- **Article 51** introduces the Mitigation and Adaptation Working Group as an important entity within efforts aimed at the coordination and implementation of obligations prescribed by the law.

5.5. Indicators

Indicators are the basis of the M&E framework for monitoring adaptation. They will be used to collect and analyse data so as to draw reasonable conclusions about Montenegro's progress in the field of climate change adaptation.

The structure of indicators within Montenegro's M&E system is based on the approach from the Repository of Adaptation Indicators developed by GIZ.[29] The GIZ structure for adaptation indicators

[29] Repository of Adaptation Indicators

uses a chronological and systematic approach to the selection of indicators, which is suitable for the context of climate risks and selected adaptation measures in Montenegro. Indicators are set for each sector individually, including the sector that monitors the overlaps in climate adaptation and supports cross-cutting cooperation.

The categories of indicators are:

Climatic parameters
Indicators measure observed and projected climate parameters (i.e., temperature, precipitation, sea level rise). The purpose of these indicators is to measure existing climate change in relation to which adaptation measures are implemented.

Climate impacts
Indicators measure the specific impact of climate change and climate variability on social, economic and environmental systems (e.g. the number of deaths caused by heatwaves or the % of ecosystem damaged by wildfires). In particular, these indicators measure the effects that changes in climate parameters will have on sectors.

Adaptation measures
The indicators monitor the implementation of adaptation measures (e.g. the number of capacity-building meetings held on the topic of adaptation or the number of hydrological monitoring stations set up). They can also be interpreted as outputs.

Result of adaptation
The indicators monitor the long-term impact of adaptation measures. These indicators measure the effectiveness of measures in terms of building capacity to adapt or reduce vulnerability (e.g. quantity in m^3 of water saved or % of drought-tolerant crops relative to all crops). They can also be seen as an outcome.

Process

The indicators monitor progress in the adaptation policy and the process of taking action. As certain elements of the monitoring system will be established soon or are being established, process indicators will support the monitoring of these processes.

Gender considerations and social inclusion

The indicators measure the impact of adaptation measures on reducing the vulnerability of marginalized groups, with an emphasis on monitoring the impact on women and girls. In addition to specific indicators, gender considerations and social inclusion are also integrated through entire Monitoring and Evaluation Framework.

5.6. Current indicators

In order to facilitate the CCAP monitoring in Montenegro, an initial list of indicators was prepared. These indicators cover the main CCAP sectors: water, agriculture, health, tourism, as well as cross-cutting activities. In addition, the indicators include a special category of climate parameter indicators to monitor climate stimuli.

The initial indicators were prepared after a rigorous process of identification, prioritization and selection so as to select indicators that are suitable for the existing capacities of Montenegrin ministries and institutions, relying on existing data collection processes and methodologies.

The selection process was rigorous, and the indicators were developed through joint efforts of representatives of the relevant institutions. Initially, a revision of the existing indicators and data collected in Montenegro by various institutions relevant for the CCAP was carried out. Synergies between other frameworks, agreements and programs were then identified, and relevant data related to climate change and adaptation measures, for example from the Sustainable Development Goals (SDGs), were identified. This list was complemented by internationally accepted climate change indicators, for example from the Repository of Adaptation Indicators developed by GIZ. Finally, the long list of indicators was completed with an analysis of gaps in vulnerability assessments and CCAP measures to identify monitoring opportunities. The final shortlist of indicators can be found in the table below:

Table 5.2: Initial list of indicators

Sector	Indicator code	Indicator	Unit
Water	W1	% of the area covered by flood risk mapping compared the total land area.	%
	W2	Number of people living in flood-prone areas, by gender.	Number
	W3	Losses due to flooding on an annual basis. i) financial losses (€), ii) Number of deaths	Euro (€)
	W4	SDG 6.5.1 - Degree of Integrated Water Resources Management.	%
	W5	SDG 6.4.1 - Change in water use efficiency over time.	%
	W6	SDG 6.1.1 - Proportion of population using safely managed drinking water services.	%
Agriculture	A1	Days of agricultural drought on an annual basis.	Days
	A2	Change in the agro-phenological phase of cultivated crops (in days).	Days
	A3	Number of frost days during the growing season.	Days
	A4	Area (ha) of agricultural land subject to the combined practice.	Hectare (Ha)
	A5	Area of vineyards at an altitude above 600m.	Hectare (Ha)
Health	H1	Number of cases of vector-borne and waterborne diseases.	Number
	H2	Number of hospital beds located in flood risk areas.	Number
	H3	Education, awareness-raising, guidance and support for protection from high temperatures according to the scorecard.	Result
	H4	Number of health institutions implementing disaster preparedness and climate resilience measures.	Number
	H5	No. of municipal plans for heat waves.	Number
	H6	SDG 3.9.1 - Mortality rate attributed to domestic and environmental air pollution.	Number
Tourism	T1	Number of tourists and number of overnight stays per tourist.	Number and number of overnight stays
	T2	Annual change in the number of ski days.	%
	T3	Number of high-altitude mountain pastures (katuns), ethno-villages and eco-tourism-based businesses.	Number
Cross-cutting	CC1	Number of municipalities that have installed early warning sirens.	Number
	CC2	Number of civil servants trained on climate change adaptation and disaster risk management.	Number
	CC3	Number of stakeholders completing training on climate change monitoring per year.	Number
	CP1	Average monthly temperature.	C^0
	CP2	Monthly precipitation.	Millimetre (mm)

Climatic parameters	CP3	SPEI drought index.	Value
	CP4	Number of days with extreme weather conditions.	Days
	CP5	Number of warm days.	Days

5.7. Indicator passport

The shortlisted indicators and priority indicators to be monitored and/or developed after the adoption of this CCAP are elaborated in the indicator passports with details shown in Table 6.2 below.

Table 5.3.: Indicator passport

Category	**Description**
Indicator name	
Units	Data collection unit (i.e. %, days, km^2, mg/L)
Goal	Goal of the indicator, including measure alignment
Brief description	A brief explanation of the indicator (what the indicator is, why it is relevant, what is being measured, any limitations regarding the indicator, etc.)
Data type	Type of data that needs to be collected.
Data source	Data sources of the indicator – (e.g. institutional reports, official websites of institutions, publicly available international indices and indicators, bodies for producing official statistics, etc.)
Responsible institution	Overview of the responsible institution and, where relevant, the specific unit and name of responsible person including contact telephone and email address.
Collection frequency	Outline of when data will be collected, highlighting if this must occur more regularly than the standard annual collection.
Reporting frequency	Outline of how regularly the indicators will be reported on the performance to target values.
Methodology description	A description of the methodological approach to the indicator including any relevant equations. For example, the formula or equation may measure: ● Volume, extent, coverage (Number of...) ● Ratio (A relative to B) ● Percentage, proportion (%; A/B x 100) ● Average (a1+a2+a3/n) ● Index (specially developed methodology) ● Qualitative – the relevant qualitative method will be described.
Trend and baseline value	**Year** **Trend [year]** **Trend [year]** **Baseline [year]**
Value	
Target value	**Year** **Trend [year]** **Trend [year]** **Baseline [year]**
Target value	

A detailed list of indicators with indicator passports is attached in Appendix C: Indicator Passport

5.8. Vision of the M&E framework and future indicators

As the M&E framework for the purposes of the CCAP evolves, it is of essential importance to continuously update and expand the set of indicators used to assess progress and effectiveness. Future indicators will address emerging climate risks, vulnerabilities and adaptation needs, thus ensuring that the M&E framework remains relevant and comprehensive.

Future indicators will be designed to cover a wider range of climate impacts and adaptation responses. These indicators will be developed through a rigorous process, which includes stakeholder consultation and expert input, to ensure that they are specific, measurable, achievable, relevant and time-bound (SMART).

The addition of new indicators will provide a more detailed understanding of the adaptation in Montenegro. It will include monitoring of emerging climate hazards and adaptation measures, assessment of the effectiveness of innovative adaptation measures, as well as adequate monitoring of all sectors and vulnerable groups.

Below is a table with some of the future indicators that should be included in the M&E system. These indicators are not included in the current list because there are currently no resources or capacity to collect data about them, but efforts should certainly be made to include these useful indicators.

Table 5.4.: Future indicators to be included in the M&E system

Sector	Indicator code	Indicator	Unit
Water	W7	Annual losses due to flooding. ii) Number of deaths	Number
	W8	No. of projects on natural water retention management	Number
	W9	Number of water supply companies implementing the new rules on sanitary zones	Number
Agriculture	A5	Losses in agriculture: (i) agricultural yields; (ii) type of crop (iii) climate hazards	%
Health	H7	Number of deaths associated with heat waves	Number
Tourism	T4	Percentage of the ecosystem area that has been disturbed or damaged	%
	T5	Annual change in the number of tourists coming for sustainable tourism activities	%

5.9. M&E system update

The M&E system should be a dynamic and evolutionary system based on learning and collected data. As sectoral assessments of climate risks and vulnerabilities are developed for new sectors, or updated for existing sectors, and actions are modified, it is recommended to revise and update the indicators, as well as to verify the responsibilities of institutions. Support for conducting sectoral climate risk and vulnerability assessments can be found in the document "Manual for Conducting Sectoral Climate Risk and Vulnerability Assessments".

CCAP and related climate risk and vulnerability assessments are not a one-time activity, but a continuous process that must respond to changes in resilience, new knowledge and information on climate change, changing risks, as well as to all changes in the social, economic and political context of Montenegro. Continuous monitoring and periodic updates of the CCAP and related climate risk and vulnerability assessments will ensure that their content remains relevant, accurate and aligned with changing circumstances both in Montenegro and globally.

The priority task is to update the basic indicators established under the CCAP Monitoring and Evaluation Framework. For each one of them, there is an indicator passport that provides detailed information about the methodology and approach to the collection of data about a specific indicator, including units and data sources, responsible institution, frequency of collection and reporting, as well as compliance

of the indicator with CCAP objectives. The indicators under the M&E framework have been developed to cover different sectoral vulnerabilities, climate impacts and adaptation measures in different sectors.

The basic indicators should be updated in line with the methodology and by using the latest data and sources.

A detailed list of indicators with indicator passports can be found in Appendix C: Indicator Passport

5.10. Monitoring of the National Climate Change Adaptation Plan

Monitoring of the CCAP implementation means a regular process of collecting, analysing and evaluating gender-disaggregated data related to the achievement of the objectives and results under the CCAP. Monitoring includes supervision of the implementation of activities, compliance with defined deadlines, levels of indicator fulfilment, as well as monitoring of the progress of the implementation of climate change adaptation measures.

Institutional framework for monitoring

CCAP monitoring will be carried out by the Ministry of Ecology, Sustainable Development and North Region Development (the Ministry), in cooperation with the Directorate for Climate Change and Sustainable Development (the Directorate). The Directorate is responsible for coordination, preparation and implementation of the strategy, as well as for the implementation of the Action Plan 2025-2027 (the Action Plan).

The relevant authorities and organizations involved in the development and implementation of the strategy are required to regularly deliver all necessary data to the Ministry. A focal point will be appointed in each responsible institution to provide the requested information and facilitate coordination.

Annual monitoring and reporting
The monitoring will focus on annual monitoring of the level of implementation of the activities identified in the Action Plan, relying on result indicators, while the evaluation will further analyze the performance indicators. All institutions involved in the CCAP implementation will deliver their reports to the Ministry in the form of standardized progress monitoring tables, which will include key data needed to assess the implementation.

Coordination and supervision
Under the law, the NCSD Working Group with a mandate in the field of climate change supports monitoring related activities. The NCSD Working Group will include representatives of all relevant institutions and will meet at least once a year to assess progress, discuss challenges and identify recommendations for further activities. The Ministry – specifically, the Directorate for Climate Change and Sustainable Development will have the coordination role within the NCSD working groups on this matter.
Monitoring framework and indicators
Progress in the CCAP implementation will be monitored through a monitoring framework that includes gender-disaggregated result and performance indicators. The tables with indicators will contain the calculation methodology, data sources, collection dynamics and responsible institutions.

Assessment and improvement process
In accordance with the monitoring plan, the entities responsible for implementation of activities will hold regular meetings to review the collected data, evaluate the success of the implemented measures and

plan further development. These meetings will facilitate the exchange of experiences, the identification of good practices and joint solutions for challenges.

Reporting and transparency
Ministry – the Directorate will consolidate data and prepare annual reports on the progress of the CCAP implementation, which will include detailed tables, indicator analyses and recommendations for further actions. These reports will be made available to all relevant stakeholders, as well as the public, to ensure transparency and participatory approach.

This comprehensive monitoring system ensures continuous monitoring of the implementation of adaptation measures and provides the basis to improve activities and strengthen Montenegro's resilience to climate change.

5.11. Evaluation of the National Climate Change Adaptation Plan

The Ministry of Ecology, Sustainable Development and Northern Region Development, responsible for implementing, monitoring and reporting on the CCAP, is also tasked with carrying out the evaluation process.

Methodology and purpose of the evaluation
In line with national regulations and guidelines for strategic planning, CCAP evaluation is defined as a systematic and objective assessment of the content, implementation and results of a strategic document. The purpose of the evaluation is multiple:

- To promote accountability: progress monitoring and compliance with the set goals;
- To learn and improve: formulation of recommendations based on new information, knowledge and data to improve implementation processes and future policies.

Evaluation aims to assess the relevance, efficiency, effectiveness, impact and sustainability of the CCAP, differing from monitoring by its depth and focus on results and processes.

Types of evaluation
The CCAP evaluation will be carried out in two phases:

- Mid-term evaluation (formative). Implementation period: early 2030.

Purpose: To assess the quality of the implementation and identify areas for improvement. It will focus on processes and methods of the implementation, providing key information for streamlining. Planned budget: €10,000.00 (planned in the Ministry's budget for 2030).

- Final evaluation (summative). Implementation period: early 2035.

Purpose: To assess the results and effects of the implementation, with an emphasis on performance and sustainability. This evaluation will serve as a basis for decisions on the extension, modification or development of a new plan. Planned budget: EUR 15,000.00 (planned in the Ministry's budget for 2035).

The process of conducting the evaluation

The Ministry of Ecology, Sustainable Development and Northern Region Development will hire independent external evaluators to ensure objectivity and impartiality of the process of monitoring and evaluating the implementation of the Climate Change Adaptation Plan (CCAP). This approach will make it possible to carry out the evaluation in accordance with international standards, without the influence of internal interests and political pressures, thus ensuring the transparency and credibility of the results.

Evaluation findings

The findings of the mid-term evaluation will be used to adjust the implementation strategy, while the results of the final evaluation (ex-post) will constitute a key part of the final report on the CCAP

implementation. These findings will be integrated into the planning process of the next policy cycle, providing a basis for strategic decision-making and improvements.

Conclusion

CCAP evaluation is not only a tool for monitoring progress but also a key component of strategic learning and adaptation. The planned evaluation processes enable transparency, accountability and continuous improvement in the implementation of climate change adaptation measures in Montenegro.

6. Information for the public on the objectives and expected effects of the CCAP in accordance with the communication strategy of the Government of Montenegro

Framework to strengthen resilience to climate change

The Climate Change Adaptation Plan represents the continuity of the activities of the Ministry of Ecology, Sustainable Development and Northern Region Development, relevant sectoral authorities and the Government of Montenegro aimed at strengthening resilience to climate change and reducing the risk of natural and other disasters. The document focuses on preventive, operational and remedial actions in order to reduce vulnerability and ensure sustainable development, and represents an important segment of meeting the conditions in the EU accession process.

Reducing the climate change risks and building resilience requires synergy between the public and private sectors, all levels of government and a wide range of communities. In this regard, the strategic and operational objectives of the CCAP rely on:

- *Internal communication*: coordinated cooperation between organizational units of key institutions based on predefined procedures and rules.
- *External communication*: partnerships at national and international level, involving citizens and the private sector.

Transparency and public availability

As the foundation for success, CCAP is based on transparency. The NCSD Working Group responsible for monitoring the CCAP implementation, together with the relevant Ministry, has the task to:

- Promote the strategy through public and professional events;
- Involve representatives of the economic sector in the implementation of the measures;
- Ensure that information on the plan is available on the official platforms of the Government and the Ministry;
- Regularly publish reports on the implementation and evaluation of the plan.

Activities & Campaigns

The NCSD Working Group responsible for monitoring the CCAP implementation, together with the relevant Ministry, and in coordination with relevant partners, will carry out promotion activities through:

- Organization of thematic round tables and campaigns;
- Joint media appearances;
- Training and raising awareness of different target groups about the importance of adaptation to climate change;
- Establishment of a system that makes it possible to receive feedback from citizens and other stakeholders to ensure a responsible approach to the implementation of measures.

Information for the public

In line with the communication strategy of the Government of Montenegro, information on the objectives and expected effects of the CCAP will be presented:

- *To the public:* through presentations of the current situation and planned activities;
- *To businesses*: by focusing on the necessary resources and measures;
- *To international partners*: through promotion of adaptive solutions and practices.

Raising awareness

A special focus is placed on raising awareness of climate risks, including understanding the long-term implications and the importance of cooperation between all stakeholders in building a resilient society.

The CCAP is designed as an adaptable, inclusive and transformative framework that ensures a sustainable future for Montenegro. Its implementation depends on the coordinated efforts of all sectors and levels of the society.

7. Financial framework for the implementation of the Plan

7.1. Overview

A key component of the CCAP implementation is mobilizing sufficient financing. This chapter details a finance strategy for the implementation of the CCAP priorities in agriculture, water, tourism, and health in Montenegro. The CCAP Finance Strategy has been developed by:

- Assessing CCAP financing needs through costing CCAP priority measures;
- Identifying available domestic public sector financial resources to contribute to the implementation of these priority measures;
- Matching financing sources to the CCAP priority measures by characterizing the measures in terms of their investment case, co-benefits, revenue generation potential and public budget impact.

Bringing these components together, the financing strategy develops recommendations for mobilizing adaptation finance from domestic sources, private sector and international climate finance to implement CCAP priorities. It is also worth noting that CCAP will not be financed in a single effort. Rather, financing of CCAP priorities requires an iterative and dynamic process that will be continuously updated according to the Plan implementation and development needs.

This chapter also makes recommendations for arrangements to ensure sustainable financing of climate change adaptation in Montenegro over the medium to long-term. Key next steps in this regard are developing an adaptation project pipeline, concept note development and sequenced actions to mobilize additional CCAP financing.

7.2. CCAP financing needs

A key building block for the CCAP financing strategy is a cost-benefit analysis (CBA) to both financing needs and the investment cases for CCAP measures. The CBA relies on indicative costing that was conducted by focusing on the specific CCAP priority measures, including the actions and timelines for implementation developed during the CCAP process.
It should be noted that costs indicated are considered as a lower boundary for adaptation financing needs, as a range of further measures can be implemented beyond those prioritized in the CCAP. The full scale of adaptation financing needs will thus be larger than the figures given in this chapter.
As already noted, it will require the establishment of an iterative and continuous process to ensure that available funds are sufficient for long/term, effective and sustainable climate change adaptation scale-up for effective adaptation.

Overall financing needs for the prioritized measures in the CCAP priority sectors are estimated at a present value of **€27.2 million** over a 5-year cycle for initial implementation covering the four priority sectors. Importantly, for all sectors, the net present value (NPV) of measures is positive indicating an investment case for the adaptation in CCAP priority sectors. Below, we explore sources of domestic and international finance for meeting these financing needs.

7.3. Domestic sources of adaptation finance

The national budget is a promising source of the CCAP finance. Recent reviews of climate and adaptation finance provide an overview of the scale of potentially adaptation-relevant finance[30,31]. While there is a lack of data on the specific activities funded by these allocations to fully track adaptation expenditures currently, this analysis gives a rough indication of funding volumes that could be mobilized

[30] UN Montenegro, Report: SDG Funding in Montenegro, Report on SDGs (United Nations, Montenegro, 2023).
[31] CBIT, Draft report of the CIBIT project for Montenegro on gaps in climate change related capacities and expenditures (CBIT/GEF-7, 2023).

for CCAP priorities. It also offers insight into the agencies, funding instruments and budget lines that are involved in the financing process. These insights represent an important basis input for the formulation of a roadmap that will ensure sustainable continuity of the CCAP financing strategy.

Overall, adaptation-relevant expenditures in the 2022 budget were €43,573,686, which is 1.68% of the total budget (CBIT, 2023). The largest share of adaptation-relevant expenditures was for environmental protection, which potentially provides cross-cutting support to the CCAP priorities. Agriculture and water sectors received the second largest share of adaptation-related expenditures in 2022 (9%) at €17.1 million. These funds are largely spent on physical capital in both on farm and processing and marketing activities, though, as noted, available data does not permit identifying specific adaptation relevant activities. Tourism and health sectors received much less domestic budget expenditures, i.e. €1.0 million for sustainable tourism in 2022, and there was no adaptation-related spending in the health sector. For both sectors, significant additional funding sources are required for CCAP implementation.

Beyond sectoral funding volumes, the CCAP Financing Strategy also identifies specific funding instruments directly related to CCAP measures, as potential NAP funding sources. To do this, existing sectoral policies and strategies, budget lines and expenditures were reviewed based on CBIT (2023)[32] findings and Action Plan for implementing Chapter 27 - Environment and Climate Change[33]. This analysis identified entry points for scaling up domestic adaptation financing. As mentioned, next steps in the CCAP Financing Strategy should include road map actions to leverage these entry points for mobilizing adaptation finance (see section 1.4).

In the period leading up to the accession to the European Union, the implementation will focus on securing funds from allocations for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD.

Given the complexity and multi-sectoral nature of climate change adaptation, the plan is to form project teams, in coordination with the line ministry, that will have the task of securing these funds. Only after these options are exhausted would the national budget become a potential source of funding. Once it joins the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available and could provide significant financial support.

Entry-points for adaptation from domestic public finance include focusing on:

- Scaling up existing agri-environmental schemes in the agricultural sector;
- Mainstreaming climate adaptation into agriculture budgeting processes to mobilize agriculture sector physical on-farm and processing capital expenditures for adaptation;
- Mainstreaming climate adaptation into fiscal support for the tourism sector, e.g., through supporting eco-tourism developments;
- Mobilizing Biodiversity Development Strategy funds for supporting a sustainable biodiversity economy, and the developing PES schemes for both agriculture and tourism sectors.

Entry-points for adaptation in the Action Plan for fulfilling closing benchmarks under chapter 27:

- Water sector actions relevant for CCAP implementation:
    - Implementation of basin water management plans;
    - Flood hazard and risk mapping;
    - Preparation of flood risk reduction measures in vulnerable areas;

[32] CBIT.
[33] The Government of Montenegro, Chapter 27: Environment and Climate Change, An Assessment of Investment Needs (The Government of Montenegro, 2020).

- Marine ecological monitoring.

- Tourism sector actions relevant for CCAP implementation:
  - Support for rural tourism development;
  - Support for diversification of tourism offer;
  - Protection of marine areas.

7.4. International sources for adaptation finance

As noted above, domestic finance will not be sufficient for full CCAP implementation, and therefore international adaptation finance are expected play a key role in the financing strategy. International adaptation finance flows to Montenegro over the period 2015-2020 show that multilateral development banks, the EBRD ($25.4 million), IBRD ($16.3 million) and IFAD ($6.45 million) are the largest providers of adaptation finance in the country. Most adaptation finance to Montenegro is disbursed through concessional loans from MDBs (85.9%) in the transport, agriculture, and water sectors. Thus, dedicated climate funds alone may not be sufficient and soliciting MDB funding for CCAP priorities is an important component of NCCAP financing and is required to scale-up adaptation finance. Further, alternative sources of finance beyond MDBs may be required particularly for the tourism and health sectors, due to potentially less domestic finance being available for CCAP priorities.

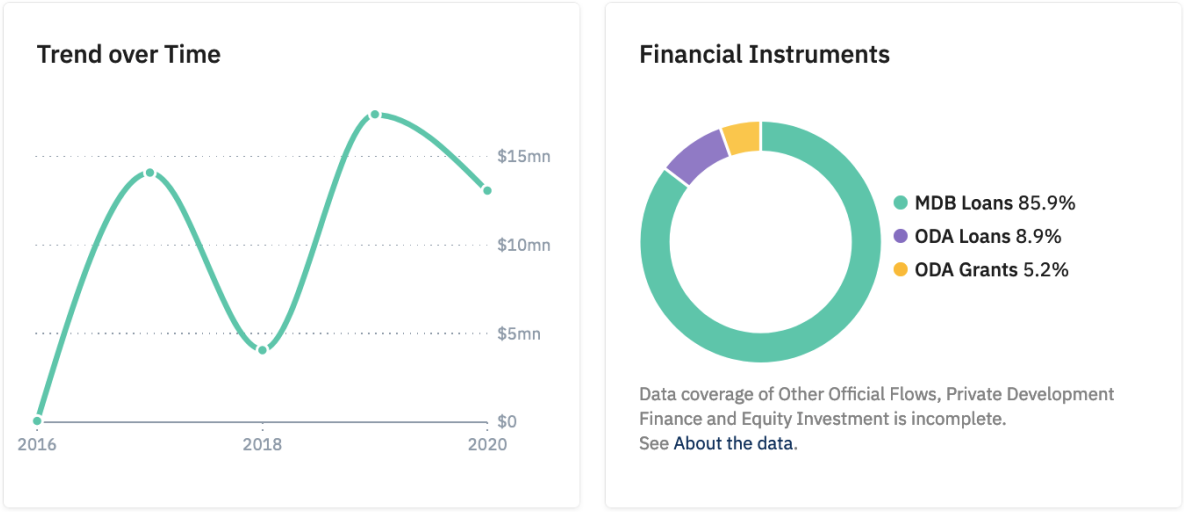


Figure 7.1. International flows of climate adaptation finance to Montenegro (2016-2020). Source: Atteridge et al. 2022.

Key multilateral climate funds include Green Climate Fund (GCF), the Adaptation Fund and the GEF. While key multilateral finance institutions for Montenegro include European Bank for Reconstruction and Development (EBRD), International Bank for Reconstruction and Development (IBRD) and International Fund for Agricultural Development (IFAD).

7.5. Matching financing sources and adaptation finance needs

In order to target efforts at mobilizing resources to appropriate financing sources, the CCAP Financing Strategy conducts a matching of finance sources to the financing needs of specific CCAP measures. To do so, CCAP priority measures have been characterized according to their co-benefits, (i.e. biodiversity, mitigation, and other environmental co-benefits); revenue stream generation potential; and its public budget impact. Based on these characteristics and available funding from well-aligned domestic sources, recommendations for financing strategies are made for priority measures in each CCAP sector.

Figure 7.2 shows the co-benefits of CCAP prioritized measures across all four priority sectors. Encouraging for financing mobilization, nearly half of the priority measures (6) have multiple co-benefits, which provide opportunities to mobilize fundings from a range of sources beyond their specific sector. Further, half the measures provide other environmental benefits, e.g. water quality or land and soil conservation, that are also promising for financing due to these co-benefits contributing to EU policy objectives. Biodiversity co-benefits are identified for 7 adaptation measures which indicate the importance of soliciting funding sources for nature-based solutions addressing climate adaptation. For mitigation co-benefits, 4 measures could be identified, which holds potential for mobilizing funding for cross-cutting projects, which are of increasing importance for multilateral funds, e.g., GCF. More challenging are the 7 measures that do not generate co-benefits, e.g., health sector measures. Based on this characterization and matching to financing sources, the following recommendations can be made for specific NAP measures.

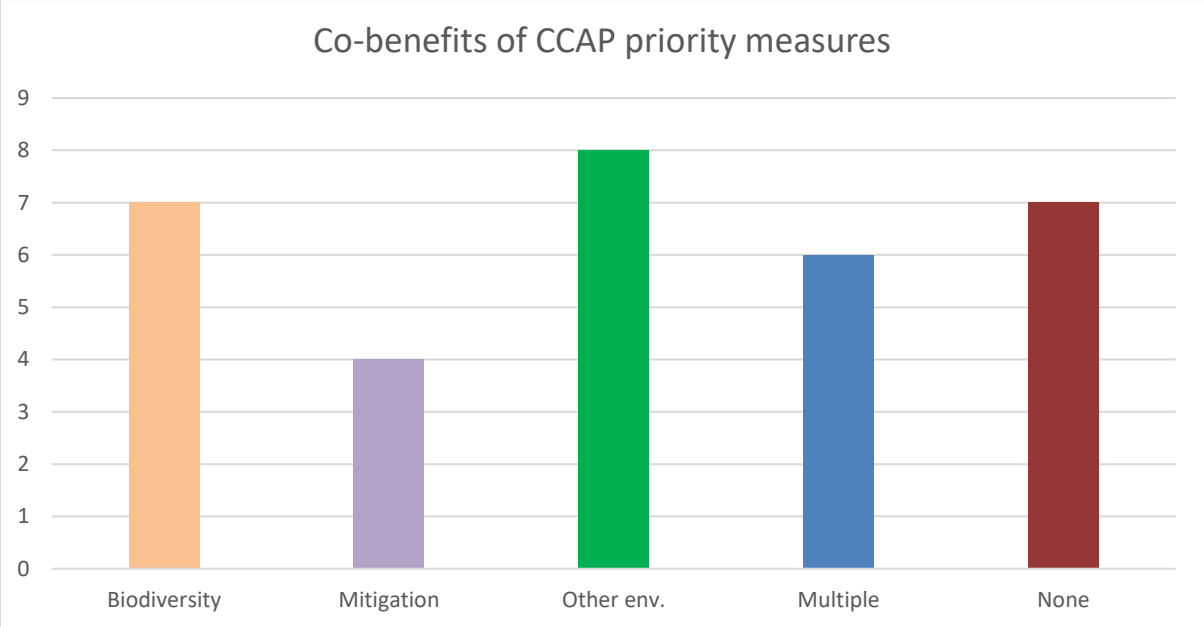


Figure 7.2. Co-benefits of NAP prioritized measures in the agriculture, water, tourism and health sectors (n=16).

For the agricultural sector, financing CCAP implementation should focus on:

- Mobilizing existing budget instruments for technical measures of climate-smart agriculture for high value crops (A17) and reducing stress on livestock;
- For measures with biodiversity co-benefits, existing fiscal instruments, e.g., agri-environmental schemes and biodiversity funding, may provide some funding. This can be scaled up through soliciting international biodiversity finance;
- For all agriculture sector measures, there is potential for private finance to scale up activities, which should be informed by private sector market analysis for adaptation.

For the water sector, financing CCAP implementation should focus on:

- Mobilizing existing domestic budget instruments for all measures. IPA funding is highly relevant due to the alignment with EU legislation, e.g., WFD and Flood Directive;
- For measures with biodiversity co-benefits, existing domestic biodiversity funding may provide some funding. This should be scaled up through international biodiversity and relevant mitigation finance, e.g. for reforestation;
- Potential for private finance to scale up water sector activities is limited, due to their public goods characteristics. There is some potential for public-private partnerships (PPP), e.g. companies directly exposed to flood risk, to be explored;

- Water sector measures may be usefully linked to Green Bonds due to their positive public budget impacts.

For the tourism sector, financing strategies should focus on:

- Mobilizing existing domestic budget instruments.
- For measures that have biodiversity co-benefits, existing fiscal instruments outside the tourism sector, e.g. funding of biodiversity and eco-system services, may provide some additional funding;
- Soliciting further international biodiversity or mitigation finance is recommended.

For the health sector, financing strategies should focus on:

- Mobilizing existing domestic budget instruments for all measures. IPA funding is highly relevant due to the alignment with, e.g., EU Climate Change Adaptation Strategy.
- Blended finance, concessional debt, and green bonds should be considered as a strategy to scale up adaptation finance in the health sector due to public goods and potential positive public budget impact of health sector measures;
- Sources of funding biodiversity protection and eco-system services that contribute to the health and well-being should also be considered.

7.6. Next steps: adaptation project pipeline development

Financing CCAP implementation involves a number of projects that cannot be implemented all at once. Rather, an ongoing iterative process of developing projects, mobilizing finance, implementing measures, and monitoring and evaluation is required (Figure 7.3). The approach of the initial Financing Strategy is to focus on CCAP priority measures selected through multicriteria analysis and stakeholder consultations. Further, the measures' relevance for financing sources is identified through analysis of their co-benefits, while their investment case has been assessed through CBA. The strategy thus prioritizes adaptation actions that can be undertaken in the short term (i.e., 5 years or less), within a reasonable budget and are aligned with national development plans (IISD, 2022).

This CCAP Finance Strategy has thus far addressed the first three steps in this cycle. First, funding priorities are defined by the review of national policy frameworks and stakeholder consultations, which developed CCAP priorities. Second, priority measures were then developed into adaptation projects and costed. Third, recommendations for alignment of NAP measures have been developed, based on analysis of CCAP measure co-benefits, revenue stream generation and public budget impacts. These recommendations can inform both the elaboration of Concept Notes to solicit international adaptation finance, e.g. GCF, as well as, engaging further international climate financing mechanisms, and their associated accredited entities (AE) in order to assess how opportunities and gaps in the existing climate finance landscape identified above can best be addressed.

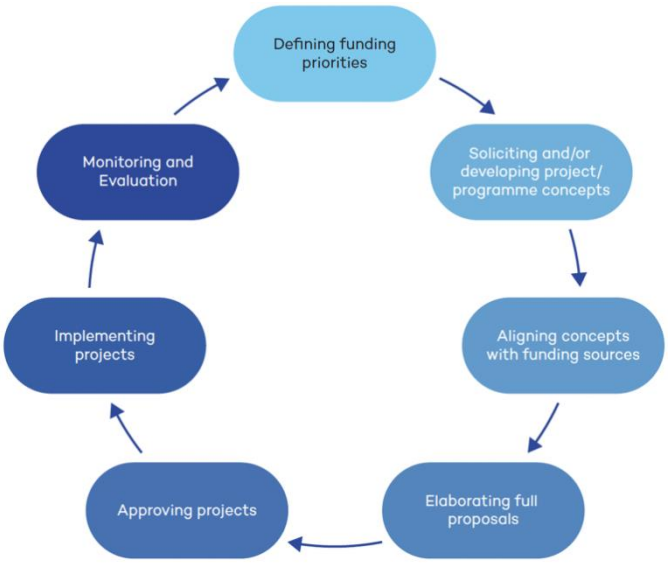


Figure 7.3. Project financing and implementation cycle for NAP priorities (Source: IISD, 2020).

More broadly, an essential next step in the Financing Strategy for the CCAP is developing an adaptation project pipeline in order to sequence investments and efforts at mobilizing additional financing. Project pipeline development involves integrating criteria of investment readiness and existing financial support with criteria for investment prioritization, e.g. Net Present Value (NPV), adaptation benefits, revenue streams, analysed in the CCAP financing strategy report and summarized above. The pipeline criteria aim to provide a sequencing of investments that prioritizes measures with immediate benefits in the short term and also lays the foundation for high-benefit adaptation investments over the medium to long term.

As CCAP priorities have already been translated into specific projects in the CCAP, key steps have already been taken for pipeline development. Further pipeline development will involve sequencing of actions to engage in concept note and full proposal development for selected CCAP measures, e.g., those particularly appropriate for international climate funding.

Conclusion

Process-oriented climate change adaptation planning, a principle that constitutes the backbone of this document, implies a dynamic and interactive approach that focuses on the continuous improvement of the CCAP and adaptation measures. This approach begins with the development of an initial strategic document that identifies current and future climate risks, assesses the vulnerability of the four sectors, and proposes appropriate adaptation measures. Once the initial document is adopted, the process continues through regular evaluation and review cycles, which allow the CCAP adjustment based on new knowledge, technological innovations and changes in climate patterns. This interactive process ensures that adaptation plans remain relevant and effective in addressing the increasingly dynamic challenges posed by climate change. Continuous improvement enables flexibility and resilience of the system, which is of key importance for reducing the negative impacts of climate change on the society and ecosystems.

The Climate Change Adaptation Plan defines the obligation to appoint CCAP coordinators in key institutions, who will act as focal points, thus ensuring cross-sectoral cooperation that is crucial for effective implementation of the plan. Cross-cutting cooperation and coordination is ensured through specialized working teams, which are a key pillar of process-oriented climate change adaptation planning within the CCAP. This approach ensures synergies between sectors and facilitates more efficient implementation of planned measures, with special emphasis on ensuring adequate sources of financing.

Given the limited resources in the national budget, the document recommends a stronger focus on alternative sources of financing, along with proactive engagement in the mobilization of international funds. A key priority is to focus on available international financial mechanisms, including the Adaptation Fund, the Green Climate Fund (GCF) Readiness, the Global Environment Facility (GEF), with the current availability of these funds estimated at more than $20 million, as well as other specialized climate change funds. The plan is also to use the financial instruments available through the EU accession processes actively, as they represent a significant potential for the implementation of strategic adaptation goals, thus creating the possibility for the stable and sustainable implementation of key adaptation measures in the coming period.

To ensure efficient implementation of funding, the plan is to form multi-sectoral project teams in cooperation with the line ministries. The teams will play a key role in obtaining these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. EU funds are particularly highlighted as a key source of support for measures in the water sector, which emphasizes the importance of their priority allocation.

The implementation strategy is based on the work of a specially formed working group, which will focus on two key tasks from the outset:

• Ensuring alternative sources of funding as a priority;

• Prioritization of measures in the planning of EU funds and the national budget.

While climate change adaptation is a relatively new topic, it is becoming increasingly important in national policy planning. Montenegro, as a future EU member state, is expected to undertake the obligation to align its policies with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal and other relevant documents. This means that the implementation of adaptation measures will not only become a legal requirement, but at the same time will also provide access to EU funds, which can significantly support their financing.

The CCAP is a strategic document that lays the grounds for the activation of financial resources, both from international sources and from the national budget. Therefore, the proposed implementation process is designed to include the formation of specialized teams for the implementation of planned measures. Each team can be in charge of multiple measures and will continuously work to secure funding, elaborate and prioritize the implementation of measures. It is crucial that this responsibility does not lie exclusively with the line Ministry or institution, but that it becomes a joint effort of several institutions, thus ensuring efficiency, coordination and long-term sustainability of implementation.

Basically, climate change adaptation is becoming an inevitable obligation of all countries that are or will become EU members soon, including Montenegro. The system we are now setting up recognizes this fact and is designed to facilitate optimal use of available financial resources through a coordinated approach and inter-institutional cooperation in order to address these key challenges.

Appendices

Appendix A: Action Plan 2025 – 2027

Introduction to the Action Plan

Taking into account that the climate change adaptation capacities in Montenegro remain limited, and that the practice of strategic planning and implementation of activities specifically aimed at adaptation– whether through institutional mechanisms, sectoral policies, projects or public and private sector funding – is not long, the Action Plan is designed as an initial step towards building a sustainable and system-based response to climate challenges.

In this context, the focus of the Action Plan is threefold:

- Establishment of a functional structure for to manage adaptation processes, including clear institutional competences, cross-sectoral coordination and the establishment of monitoring and reporting mechanisms;
- Expansion of the knowledge and data base necessary for informed decision-making, through the development of systems for collecting, processing and exchanging information on vulnerabilities, risks and impacts of adaptation measures;
- Development and operationalization of specific activities and budgetary frameworks, which will enable the start of the implementation of priority adaptation measures and create the preconditions for the mobilization of additional financial resources – including national and international sources. In accordance with the guidelines provided by the institutions during the preparation of the document, the priority focus is on creating the preconditions to attract alternative sources of financing from donations, projects and calls in order to ensure additional funds on top of those provided from the national budget.

Moreover, the Action Plan aims to promote the principle of equitable resilience, ensuring that vulnerable and underrepresented groups are included and adequately supported in the planning and implementation of measures. Also, the Plan puts emphasis on capacity building, in order to create conditions for the integration of adaptation into all sectors of public policy and strengthen institutional preparedness for increasingly evident climate risks.

Sector	Agriculture		
Agriculture sector strategic objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	ASO 2. Capacity building on climate change adaptation in order to provide a resilient food production system. ASO 3. Designing and implementing adaptive agriculture practices and measures resulting in maintenance of yields, diversification, soil, water and ecosystem services preservation.		
Agriculture sector operational objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	AOO 2.1. Raise capacities of farmers to adapt to climate change AOO 3.1. Ensure minimal losses of yields through implementation of adequate technical measures AOO 3.2. Prevent degradation of natural base of food production system		
Performance indicators for the agricultural sector	**Baseline value**	**Target value at the end of the implementation of the Action Plan in 2027**	**Target value at the end of the implementation of the Adaptation Plan in 2035**
Quantitative indicators			
Number of analyses prepared with the aim of better understanding the consequences of climate change.	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are set at zero. This was done because relevant data, needed to monitor the direct impact of the implemented measures in the coming period, are currently not available in the context of CCAP.	4	10
Number of farmers/decision-makers trained on climate-smart practices.		100	1000
Number of implemented technological solutions (e.g. irrigation systems, protective nets, solar panels).		3	50
Number of financial incentives created and implemented for farmers.		1	6
Number of policies or strategies designed and adopted to support adaptation to climate change		1	3
Area of pastures used under improved management (e.g. rotation of livestock, electric fences).		50ha	2000ha
Increase in local feed production		0	2000ha
Qualitative indicators	**Verification method**		
Increased farmers' awareness and knowledge about climate change and adaptive measures.	Evaluations by participants in the capacity-building program participants and field assessments carried out periodically.		

Improved farmers' perception of the sustainability of new practices.	Subjective assessments and feedback after implementation or piloting.
Barriers to the implementation of climate-smart measures identified and reduced.	Based on conducted analyses.
Increased customer satisfaction with financial and technical support programs.	Based on feedback.

Strategic objective	**ASO 2. Capacity building on climate change adaptation in order to provide a resilient food production system.**

Operational objective	**AOO 2.1. Raise capacities of farmers to adapt to climate change**
Measures	**A 2.1.1. Raise capacities and awareness on combined production practices**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q4 2025	Q2 2026	Appointed focal point. Working group formed. Number of members in the working group. Number of institutions represented in the working group	Ministry of Agriculture, Forestry and Water Management	Research institutions Extension services Farmers' Association National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support to the mobilization of funds from various sources. The institutions appoint persons for adaptation matters as part of their regular job duties.
Prepare a baseline study on combined agricultural practices	Q2 2026	Q4 2027	Study of the Baseline on Combined Agricultural Practices developed and adopted	Ministry of Agriculture, Forestry and Water Management	Research institutions Extension services Farmers' Association	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Contribution to the conservation of biodiversity, including genetic resources.

Prepare targeted capacity-building programs for combined agricultural production	Q3 2027	Q4 2028	Number of prepared capacity building programs	Ministry of Agriculture, Forestry and Water Management	Extension services Secondary and higher education institutions Association of Farmers	71.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Contribution to the protection of biodiversity, including genetic resources. Creation of the basis for diversification of activities and tourist valorization in rural areas.
Strategic objective	**ASO 3. Designing and implementing adaptive agriculture practices and measures resulting in maintenance of yields, diversification, soil, water and ecosystem services preservation.**							
Operational objective	**AOO 3.1. Ensure minimal losses of yields through implementation of adequate technical measures.**							
Measures	**A 3.1.1. Enhancing the application of climate-smart agrotechnical measures.**							
Activities	**Start date**	**End date**	**Process indicator**	**Responsible entity**	**Implementation partners**	**Budget (€)**	**Financing source**	**Co-benefits**
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. Working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Agriculture, Forestry and Water Management	Research institutions Extension services Farmers' Association National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support to the mobilization of funds from various sources.
Assess human, technical and financial capacities for the introduction and implementation of appropriate climate-smart practices.	Q2 2026	Q2 2027	Report on the assessment of capacities for climate-smart practices.	Ministry of Agriculture, Forestry and Water Management	Research Institutions Extension Services	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Strengthening of rural communities.

Develop and implement targeted capacity building programs for decision-makers, extension services and agricultural producers on the implementation of climate-smart practices.	Q1 2027	Q4 2027	Number of developed capacity building programs on climate-smart practices. Number of implemented programs. Number of participants from target groups.	Extension services	Educational institutions Farmers' Association	52.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Contribution to the protection of the environment. Contribution to the reduction of gender vulnerability.
Conduct market analysis in the agricultural sector with the aim of identifying the potential for the development of green entrepreneurship, and aim of developing a business proposal for the introduction or dissemination of climate-smart technologies and services.	Q2 2026	Q3 2028	Market analysis report with a business proposal prepared.	Ministry of Agriculture, Forestry and Water Management	Research institutions	20.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Promotion of entrepreneurship in the field of green business.
Introduce pilot, innovative climate-smart approaches.	Q3 2027	2029	Number of climate-smart approaches developed. Number of climate-smart approaches piloted.	Ministry of Agriculture, Forestry and Water Management	Technopolis Research Institutions	145.000		Contribution to the protection of the environment. Contribution to the reduction of gender vulnerability. Encouraging entrepreneurship in the field of green business.
Improve appropriate policy instruments to support and finance the uptake of climate-smart practices.	Q1 2027	2029	Number of improved or new policies/ instruments to support climate-smart practices.	Ministry of Agriculture, Forestry and Water Management	Extension services	30.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Contribution to the protection of the environment. Contribution to the reduction of gender vulnerability.

A 3.1.2. Identifying and implementing measures to reduce climate stress on livestock

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. Working group formed. Number of members of the working group. Number of institutions represented in the working group.	Ministry of Agriculture, Forestry and Water Management	Biotechnical Faculty Extension services Farmers' Association National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Conduct research and analysis of climate stress in livestock and identify the most cost-effective solutions.	Q2 2026	Q4 2027	A report on climate stress in livestock is prepared. Number of recommended measures/solutions to reduce climate stress in livestock.	Ministry of Agriculture, Forestry and Water Management	Research Institutions Extension services	32.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Improved animal welfare.
Involve livestock farmers to collect data, information and provide support.	Q2 2026	2028	Number of livestock farmers involved in the collection of data and information. Scope and quality of data collected in cooperation with livestock farmers (qualitative).	Ministry of Agriculture, Forestry and Water Management Extension services	Ministry of Agriculture, Forestry and Water Management Farmers' associations	8.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Strengthened rural communities, especially women.
Conduct feasibility study on local animal feed production.	Q1 2027	Q4 2027	The study is completed and verified.	Ministry of Agriculture, Forestry and Water Management	Research institutions Extension services Farmers' Association	25.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Promotion of entrepreneurship in rural communities.

Operational objective: Prevent degradation of natural base of food production. system

Measures **A3.2.1. Preservation of hay meadows and pastures and the promotion of sustainable land use practices.**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Agriculture, Forestry and Water Management	Research institutions Extension services Farmers' Association National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Assess the capacity of policymakers and agricultural producers to integrate and implement pasture management practices.	Q2 2026	Q3 2027	A report on the assessment of pasture management capacities is prepared.	Ministry of Agriculture, Forestry and Water Management	Research Institutions Extension services	22.000		Contribution to the strengthening of rural communities.

Introduce grazing management measures on pastures (electric fences, rotation of livestock, use of underused pastures and meadows).	Q3 2026	Q4 2027	Number of grazing management measures applied in the field. Type of measures (qualitative). Number of agricultural producers applying grazing management measures. Pasture areas covered by the measures.	Ministry of Agriculture, Forestry and Water Management	Extension services Associations of farmers / users of katuns	74.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Protection of land and biodiversity on grasslands. Prevention of wildfires through prevention of succession and accumulation of flammable material. Carbon sequestration.
Carry out regional grouping of katuns and provide appropriate support to regional clusters of katuns.	Q1 2027	2030	Number of formed and functional regional clusters of katuns. Number of katuns covered by support through regional clusters. Type and number of different forms of support provided to regional clusters.	Ministry of Agriculture, Forestry and Water Management	Extension services Associations of farmers / users of katuns.	70.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Strengthened rural communities. Preservation of the cultural heritage of katuns.
Develop and implement targeted capacity building programs for pasture management.	Q1 2027	2030	Number of implemented capacity building programs for pasture management.	Ministry of Agriculture, Forestry and Water Management	Advisory services of the Educational Institution of the Farmers' Association	32.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Strengthened rural communities Contribution to the protection of land and biodiversity in grasslands Contribution to fire risk reduction

Improve existing and development of new policy instruments to support and finance adaptive measures for pastures and hay meadows, including improved support for katuns.	Q3 2026	2029	Number of improved or developed policies/instruments to support adaptive measures in pastures and meadows. Officially adopted policy instrument incorporating adaptive measures for pastures and meadows.	Ministry of Agriculture, Forestry and Water Management	Extension services	28.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Strengthened rural communities. Protection of land and biodiversity on grasslands. Contribution to fire risk reduction. Preservation of cultural heritage of katuns.

Sector:	**Water**		
Water sector strategic objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	WSO 1. Improved knowledge base of water resources providing a foundation for capacity building and coordinated intersectoral water management approaches. WSO 2. Improved capacities for preparation and response to extreme hydrological weather events to reduce injury, deaths and infrastructure damages.		
Water sector operational objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	WOO 1.1. Ensure the up-to-date high-resolution data as a basis for informed decision making. WSO 2.1. Build capacities for integration of climate risks into planning.		
Performance indicators for the water sector **Quantitative indicators**	**Baseline value**	**Target value at the end of the implementation of the Action Plan in 2027**	**Target value at the end of the implementation of the Adaptation Plan in 2035**
Number of analyses prepared with the aim of better understanding the consequences of climate change impact	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are	1	6
Number of users/decision-makers trained in climate-smart practices in the water sector.		50	300
Number of implemented technological solutions (e.g. measuring stations, GIS systems, etc.).		9 new measuring stations	18 new measuring stations

Number of plans, policies or strategies developed and adopted to support climate change adaptation.	set at zero. This was done because relevant data, needed to monitor the direct impact of the implemented measures in the coming period, are currently not available in the context of CCAP.	1	4
Qualitative indicators	**Verification methods**		
Enhanced awareness and knowledge of users/decision-makers about climate change and adaptation measures.	Pre- and post-intervention surveys, interviews and evaluation forms to assess participants' changing levels of knowledge and awareness of climate change and adaptive measures		
Improved perception of users/decision-makers about the sustainability of new practices.	Interviews and interviews before and after interventions		

Strategic objective	**WSO 1. Improved knowledge base of water resources providing a foundation for capacity building and coordinated intersectoral water management approaches.**

Operational objective	**WOO 1.1. Ensure the up-to-date high-resolution data as a basis for informed decision making.**
Measures	**W1.1.1. Strengthen the network of measuring stations and improve the monitoring of water related data.**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits

Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members of the working group. Number of institutions represented in the working group.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation Support for the mobilization of funds from various sources
Procure and install new meteorological and hydrological measuring stations.	Q1 2027	2029	Number of new measuring stations. Stations installed and operational.	Institute for Hydrometeorology and Seismology	Ministry of Ecology, Sustainable Development and Northern Region Development Water Administration	81,000 (precipitation and climatological station 20000, complete meteorological station 10000, hydrological station 6000)	Donor funds (IPA, Adaptation Fund, GCF) Budget of the Ministry and the Institute	Contribution to the early warning system. Contribution to the research on climate its impacts. Contribution to spatial planning.
Conduct geodetic surveys of river beds.	Q1 2027	2035.	Number of river beds measured. Maps of river beds made in digital format and entered into the cadastre and spatial plans.	Water Administration	Institute for Hydrometeorology and Seismology	50.000	Donor funds (IPA, Adaptation Fund, GCF)	Contribution to the reduction of flood risks and increased benefits for health, well-being and the economy.
Develop capacity building programs in the field of data storage, handling and analysis	Q2 2026	Q3 2027	Capacity building program prepared. Number of training events Number of trainees participating in training events	Institute for Hydrometeorology and Seismology	Ministry of Ecology, Sustainable Development and Northern Region Development Water Administration Scientific institutions	25.000	Donor funds (IPA, Adaptation Fund, GCF) Budget of the Institute	Contribution to cross-sectoral and inter-institutional cooperation and transparency of the institutions.
Procure relevant field equipment	Q2 2026	Q4 2026	Equipment for field work purchased and used in the field. Number of field controls.	Institute for Hydrometeorology and Seismology	Ministry of Ecology, Sustainable Development and Northern Region Development Water Administration	100.000	Donor funds (IPA, Adaptation Fund, GCF) Budget of the Ministry and the Institute	Contribution to the Early Warning System

Measure	W1.1.2. Upgrading and using existing flood risk mapping to develop interventions that prioritize Natural Water Retention measures							
Activities	**Start date**	**End date**	**Process indicator**	**Responsible entity**	**Implementation partners**	**Budget (€)**	**Financing source**	**Co-benefits**
Appoint a focal point and form an intersectoral working group	Q1 2026	2035	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Agriculture, Forestry and Water Management (Directorate for Water Management)	Water Administration Directorate for Spatial Planning (Ministry of Spatial Planning, Urban Planning and State Property) Protection and Rescue Directorate (Ministry of Interior) Targeted municipalities Institute for Hydrometeorology and Seismology National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources
Develop and implement capacity building programs for decision-makers at the national and local level on natural water retention measures.	Q2 2026	Q4 2027	Capacity building program developed and implemented. Number of participants and institutions in the capacity building program.	Water Administration	Educational institutions	27.000	Donor funds (IPA, Adaptation Fund, GCF)	Contribution to the protection of land, biodiversity and ecosystem services.

Identify, develop and implement a pilot project for the remediation of degraded "water land" through habitat regeneration and other nature-based solutions, to restore and increase water retention capacity.	Q4 2026	2030	Pilot projects for the Lim and Grnčar rivers	Water Administration	Local self-governments of target locations (Gusinje, Berane)	70.000	Donor funds (IPA, Adaptation Fund, GCF)	Contribution to the protection of land, biodiversity and ecosystem services.
Strategic objective	**WSO 2. Improved capacities for preparation and response to extreme hydrological weather events to reduce injury, deaths and infrastructure damages.**							
Operational objective	**WSO 2.1. Build capacities for integration of climate risks into planning.**							
Measures	**W2.1.1. Improve capacities of policy makers and strengthen the research and management capacities. To assess the occurrence and risk of adverse impacts of climate change and adaptation of freshwater systems.**							
Activities	**Start date**	**End date**	**Process indicator**	**Responsible entity**	**Implementation partners**	**Budget (€)**	**Financing source**	**Co-benefits**
Appoint a focal point and form an intersectoral working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Ecology, Sustainable Development and Northern Region Development	Water Administration Educational institutions Ministry of Agriculture, Forestry and Water Management	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation Support for the mobilization of funds from various sources
Develop and implement a targeted training program on climate change adaptation for policy makers in the water sector.	Q1 2027	2030	Training program developed and implemented. Number of conducted training events. Number of participants in training events.	Ministry of Ecology, Sustainable Development and Northern Region Development	Water Administration Educational institutions Ministry of Agriculture, Forestry and Water Management	22.500	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Enhanced cooperation within the sector.

			Number of institutions involved in the training program.					
Develop and implement a targeted capacity building program for data collection, analysis and use in the water sector and planning.	Q3 2026	Q3 2027	Training program developed and implemented. Number of conducted training events. Number of participants in training events. Number of institutions involved in the training program.	Ministry of Ecology, Sustainable Development and Northern Region Development	Water Administration, Educational Institutions Ministry of Agriculture, Forestry and Water Management	27.000		Contribution to the early warning system. Enhanced cooperation within the sector.
Procure and install relevant hardware and software.	Q3 2026	Q4 2027	Relevant IT equipment purchased and installed.	Ministry of Ecology, Sustainable Development and Northern Region Development	Water Administration Ministry of Agriculture, Forestry and Water Management		Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget	Contribution to the digitalization and modernization of institutions

Measures	**W2.1.2. Develop new methodologies and design watershed protection zone projects at all water sources integrating climate change aspects.**							
Activities	**Start date**	**End date**	**Process indicator**	**Responsible entity**	**Implementation partners**	**Budget (€)**	**Financing source**	**Co-benefits**
Appoint a focal point and form an interdepartmental working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Ecology, Sustainable Development and Northern Region Development	Water Administration Educational institutions Ministry of Agriculture, Forestry and Water Management	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Revise the Decree and Study on Sanitary Zones	Q2 2026	Q3 2027	Ordinance and Study on Sanitary Zones updated.	Water Administration	Ministry of Agriculture, Forestry and Water Management Water utilities.	2.000	Donor funds (IPA, Adaptation Fund, GCF)	Reduced risk of waterborne diseases.

Develop and implement targeted training programs for the management of sanitary zones for water utilities.	Q2 2026	2028	Training program developed and implemented. Number of conducted training. Number of participants in training events. Number of utilities involved in the training program.	Water Authority	Educational Institutions Water utilities	23.000	Donor funds (IPA, Adaptation Fund, GCF)	Reduced risk of waterborne diseases.
Provide financing for water utilities through international funds and combined finance.	Q2 2026	2029		Ministry of Agriculture, Forestry and Water Management	Water Administration Water utilities	It depends on the available alternative sources of funding.	Donor funds (IPA, Adaptation Fund, GCF)	Contribution to the stability of water supply.
Establish a monitoring and evaluation system for water utilities	Q2 2026	Q4 2027	A system for monitoring the quantity and quality of water.	Water Administration	Water Supply Company Ministry of Agriculture, Forestry and Water Management	It depends on the available alternative sources of funding.	Donor funds (IPA, Adaptation Fund, GCF)	Strengthened institutional accountability and transparency. Preparation for access to international funds and projects.

Sector:	**Health**
Health sector strategic objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	HSO 1. Improved human and technical capacities of the health sector to provide timely planning and response to climate hazards, with a particular focus on marginalized groups. HSO 3. Improved public awareness, particularly for vulnerable groups, to reduce the health-related impacts of climate change.

Health sector operational objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	HOO 1.1 Enhance preparedness of the sector to climate change through development of processes and systems. HOO 3.1 Implement public preparedness and awareness campaigns and measures		
Performance indicators for the health sector **Quantitative indicators**	**Baseline value**	**Target value at the end of the implementation of the Action Plan in 2027**	**Target value at the end of the implementation of the Adaptation Plan in 2035**
Number of document analyses (existing preparedness plans, protocols and guidelines).	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are set at zero. This was done because relevant data, needed to monitor the direct impact of the implemented measures in the coming period, are currently not available in the context of CCAP.	2	2
Number of protocols, plans/programs, policies or strategies developed and adopted.		2	3
Number of institutions identified and involved.		5	10
Number of plans evaluated.		**5**	10
Number of SOPs developed at the national and local levels.		**2**	5
Number of health professionals trained on the basis of SOPs.		**20**	100
Number of Early Warning Systems Analyzed		**1**	1

Strategic objective	**HSO 1. Improved human and technical capacities of the health sector to provide timely planning and response to climate hazards, with a particular focus on marginalized groups.**

Operational objective	**HOO 1.1 Enhance preparedness of the sector to climate change through development of processes and systems.**
Measures	**H 1.1.1 Improve the preparedness of staff, facilities and systems in the health sector for climate hazards, through training, climate risk assessments and specific interventions.**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Health	Institute for Public Health Ministry of Interior Ministry of Ecology, Sustainable Development and Northern Region Development National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Carry out a climate risk assessment in the health sector.	Q2 2026	Q4 2027	Risk assessment conducted, verified and adopted.	Ministry of Health	Ministry of Ecology, Sustainable Development and Northern Region Development Institute for Public Health	25.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Contribution to the reduction of the gender gap in climate risks. Support to the cross-sectoral approach (One Health).
Identify and position key players in the network of health institutions.	Q2 2026	Q4 2026	Map of stakeholders in the network of health institutions created and validated.	The working group of the Ministry of Health	Institute for Public Health	Not necessary	Not necessary	Key players in the network of health institutions identified and positioned.
Collect epidemiological descriptive data and analyse environmental factors related to climate change.	Q3 2026	2035	Epidemiological and environmental data relevant for the climate change impact collected and analysed (the basis for a continuous monitoring system has been set).	Ministry of Health	Institute for Public Health Statistics Administration - MONSTAT	24.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Improved prevention and public health campaigns. Better management of environmental risks. Supported transparency.
Measures	**H1.1.2 Include and define health sector's role in hazard preparedness and response in the national and local level readiness plans**							

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Health	Institute for Public Health Primary Health Centres Ministry of the Interior Ministry of Ecology, Sustainable Development and Northern Region Development National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Conduct a comprehensive assessment of existing health sector preparedness plans at the national and local levels.	Q2 2026	Q4 2026	Report on the comprehensive assessment of health sector preparedness plans at the national and local levels developed, verified and adopted	Ministry of Health	Institute for Public Health Primary Health Centres Ministry of the Interior	21.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Support for the compliance with EU standards and international obligations. Incorporation of the principle of equity into preparedness plans. Integration of environmental risks into health planning.
Engage and collaborate with stakeholders in the health sector.	Q2 2026	2030	The level of involvement of stakeholders in the health sector	A working group of the Ministry of Health	Institute for Public Health Primary Health Centres	Not necessary	Not necessary	Enhanced intra-sectoral and cross-sectoral cooperation.
Establish effective communication and coordination mechanisms.	Q2 2026	2030	Number of established channels of communication	A working group of the Ministry of Health	Ministry of Health Institute for Public Health Primary Health Centres Ministry of the Interior	Not necessary	Not necessary	Enhanced intra-sectoral and cross-sectoral cooperation.
Measures	**H1.1.3 Introduce an early warning system to prepare the health sector for appropriate response during the weather extremes, supported by training programs to enhance knowledge and skills of the workforce in the health care facilities**							

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group	Ministry of Health	Institute for Public Health Ministry of the Interior Institute for Hydrometeorology and Seismology National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Assess the existing capacities for the early warning system in the sector and the level of integration into the national system.	Q2 2026	Q4 2026	Report on the assessment of existing capacities for the early warning system completed, verified and adopted.	The working group of the Ministry of Health	Institute for Public Health Ministry of Interior, Institute for Hydrometeorology and Seismology	Not necessary	Not necessary	Contribution to inclusivity.
Define the scope and objectives of the system's early warning system and involve stakeholders.	Q1 2027	Q3 2027	Scope and objectives of the early warning system defined, verified and adopted.	The working group of the Ministry of Health	Institute for Public Health Ministry of Interior Institute for Hydrometeorology and Seismology	Not necessary	Not necessary	Contribution to inclusivity.

Strategic objective	**HSO 3. Improved public awareness, particularly for vulnerable groups, to reduce the health-related impacts of climate change.**
Operational objective	**HOO 3.1 Implement public preparedness and awareness campaigns and measures**
Measures	**H3.1.1 Development and promotion of education, awareness raising and general guidelines and support of facilities for the population during heat waves and extremes.**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group	Ministry of Health	Institute for Public Health Ministry of Interior Ministry of Ecology, Sustainable Development and Northern Region Development, Environmental Protection Agency, Ministry of Labour and Social Welfare, National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Conduct a detailed analysis of existing measures, practices and support to the population during heat waves and extreme weather conditions.	Q2 2026	Q4 2026	Analysis done, verified and approved.	The working group of the Ministry of Health	Institute for Public Health Ministry of Interior Ministry of Ecology, Sustainable Development and Northern region Development, Environmental Protection Agency Ministry of Labour and Social Welfare	Not necessary	Not necessary	Contribution to inclusivity.
Create/update clear guidelines, action plans for the protection of vulnerable groups during extreme weather conditions.	Q1 2027	2028	Draft guidelines prepared, verified and adopted.	The working group of the Ministry of Health	Institute for Public Health Ministry of Interior	Not necessary	Not necessary	Protecting vulnerable groups. Ensuring equitable access to services and assistance.

Determine the level of knowledge, attitudes and practices of the population in the event of heat waves and extreme weather conditions.	Q1 2027	Q4 2027	A study conducted (KAP survey). The survey report is prepared, verified and adopted.	Ministry of Health	Institute for Public Health Ministry of Interior Research institutions	21.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Contribution to inclusivity.

Sector:	**Tourism**
Health sector strategic objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	TSO 1. Training and capacity building for all relevant stakeholders in the tourism sector to improve know-how and skills. TSO 3. Establishing/strengthening multi-sector coordinated approaches and mechanisms to strengthen preparedness for early warning and planning for climate change.

Health sector operational objectives whose measures fall into the period of implementation of the Action Plan 2025-2027:	TOO 1.1 Implementation of a diverse tourism offer to enhance resilience of the sector. TOO 1.2 Identify and develop funding opportunities to enhance transformation of the sector TOO 3.1 Improve coordination between climate services (climate services should provide relevant and timely information on climate risks and impacts to the tourism sector).		
Performance indicators for the health sector **Quantitative indicators**	**Baseline value**	**Target value at the end of the implementation of the Action Plan in 2027**	**Target value at the end of the implementation of the Adaptation Plan in 2035**
Number of analyses prepared with the aim of better understanding the consequences of climate change.	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are set at zero. This was done because relevant data, needed to monitor the direct impact of the implemented measures in the coming period, are currently not available in the context of CCAP.	**4**	8
Number of users/decision-makers trained on climate-smart practices.		**100**	500
Number of financial incentives created and implemented for service providers.		**2**	4
Number of policies or strategies designed and adopted to support climate change adaptation.		**1**	1
Qualitative indicators	**Verification Method**		
Increased awareness and knowledge of service providers on climate change and adaptation measures.	Pre- and post-intervention surveys, training event evaluations and interviews with service providers.		
Improved perception of service providers about the sustainability of new practices.	Surveys and interviews with service providers before and after interventions.		
Identified and reduced barriers for the implementation of climate-smart measures.	Document analysis, focus groups and interviews with relevant stakeholders.		
Increased customer satisfaction with financial and technical support programs.	User surveys and feedback analysis.		

Strategic objective	**TSO 1. Training and capacity building for all relevant stakeholders in the tourism sector to improve know-how and skills for the transformation of the tourism sector in the face of climate change and for obtaining support on implementing the adaptation activities.**

Operational objective	**TOO 1.1 Implementation of a diverse tourism offer to enhance resilience of the sector**
Measures	**T1.1.1 Developing Community-Based Tourism Programs as a Strategy for Building Climate Resilience e.g. promoting rural, agro- and eco-tourism and other high value, low impact tourism products.**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urban Planning and State Property Ministry of Agriculture, Forestry and Water Management Ministry of Finance Ministry of Education, Science and Innovation National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Develop and adopt the Tourism Development Strategy that contains elements focused on building resilience to climate change.	Q3 2026	2028	Strategy developed, verified and adopted.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urban Planning and State Property Ministry of Agriculture, Forestry and Water Management Ministry of Finance Ministry of Education, Science and Innovation National Council for Sustainable Development	The value will be confirmed later; the process has begun.	Ministry of Tourism	Contribution to cross-sectoral cooperation and cooperation between different levels of government.

Handbook/guidelines and standards for climate change adaptation in the tourism sector.	Q2 2026	Q4 2027	Manual/Guidelines developed, verified and adopted.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urban Planning and State Property Local self-governments Tourist sssociations (at national and local levels) Business community	26.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Contribution to the protection of the environment.
Development of targeted capacity-building programs.	Q2 2026	Q4 2026	Capacity-building programs prepared and ready for implementation.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Educational institutions	15.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities.
Implementation of targeted climate adaptation capacity building programs in the tourism sector.	Q1 2027	2030	Number of training events conducted Number of training participants Number of institutions involved in the training program.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Educational institutions Tourist associations (at national and local levels)	22.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities.
Designing and Implementing Public Promotion	Q2 2026	2035	Public promotion program prepared and ready for implementation.	Ministry of Tourism	Business community, Tourist associations (at national and local levels), NGOs	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering rural communities. Contribution to the environmental protection.
Development of climate change adaptation support projects in the tourism sector.	Q2 2026	2035	Number of draft project proposals. Number of submitted project proposals to donors or funds.	Ministry of Tourism	Ministry of Education, Science and Innovation, EU Funds and Other International Funds	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities. Encouraging entrepreneurship.

Operational objective	TOO 1.2 Identify and develop funding opportunities to enhance transformation of the sector.
Measures	T1.2.2 Providing financial and non-financial support to tourism-based communities who are vulnerable to climate change to help diversify and adapt to climate change, with sustainable tourism offer.

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urban Planning and State Property Ministry of Agriculture, Forestry and Water Management Ministry of Finance Ministry of Education, Science and Innovation, National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support the mobilization of funds from various sources.
Identify tourist communities vulnerable to climate change	Q2 2026	Q4 2026		Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development	21.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities.
Analyse the risks and impacts of climate change on tourism communities.	Q2 2026	Q4 2026	Analysis prepared, verified and adopted.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Research and Scientific Institutions	20.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities.

Develop a sustainable tourism offer that reduces vulnerability to climate change	Q2 2026	2035	Number of diversified tourist attractions.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Development Ministry of Agriculture, Forestry and Water Management Ministry of Health Business association Tourist associations	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities. Contribution to environmental protection.
Introduce and promote financing programs for climate change adaptation in the tourism sector.	Q2 2026	2035	Number of beneficiaries of the financial and technical support program. Amount of financial support.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Finance Investment and Development Fund Commercial banks Municipalities Donors National Tourism Organization Tourist organizations at the local level Tourist associations	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities. Encouraging entrepreneurship.
Develop and implement capacity building programs for adaptation in tourism for different groups of stakeholders.	Q1 2027	2030	Number of conducted training events. Number of training participants. Number of institutions involved in the training program.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Educational institutions National Tourism Organization Tourist organizations at the local level Tourist associations	25.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities.

Promotion of sustainable tourism.	Q2 2026	2035	Number of completed promotional campaigns. Number of people covered by promotional campaigns Number of copies of promotional materials designed and disseminated.	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Local tourism organizations Tourist associations	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities. Contribution to environmental protection.

Measures	**T1.2.3 Improve funding opportunities to facilitate research and innovation into sustainable tourism practices and how they could be implemented more widely**							
Activities	**Start date**	**End date**	**Process indicator**	**Responsible entity**	**Implementation partners**	**Budget (€)**	**Financing source**	**Co-benefits**
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group	Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urban Planning and State Property Ministry of Agriculture, Forestry and Water Management Ministry of Finance Ministry of Education, Science and Innovation National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Identify key problems and challenges related to climate change and tourism.	Q2 2026	Q4 2026	A report on key issues drafted, verified and adopted.	Working Group Ministry of Tourism	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urban Planning and State Property Ministry of Agriculture, Forestry and Water Management Ministry of Finance Ministry of Education, Science and Innovation National Council for Sustainable Development	Not necessary	Not necessary	Contribution to the development of science, research and innovation.

Analyse existing sources of financial support for research and innovation on sustainable practices in tourism.	Q2 2026	Q4 2026	Analysis of the sources of funding prepared, verified and adopted.	Ministry of Tourism	Ministry of Finance Innovation Fund	10.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Empowering local communities and small businesses.
Establish a program to finance the development of innovative and sustainable practices in tourism.	Q2 2026	2035	Number of funds established and amount of funds. Number of beneficiaries.	Ministry of Tourism	Ministry of Finance Innovation Fund Investment and Development Fund Commercial banks Municipalities Donators	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget NTO	Empowering local communities and small businesses.
Financial and mentoring support for the implementation of sustainable initiatives and examples of good practice in the tourism sector (pilot projects).	Q2 2026	2035	Number of beneficiaries. Amount of financial support.	Ministry of Tourism	Ministry of Finance Innovation Fund Investment and Development Fund Commercial banks Municipalities Donors Research institutions	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget NTO	Empowering local communities and small businesses.
Promote funding programs intended for the development of innovative and sustainable activities in tourism.	Q2 2027	2036	Number of completed promotional campaigns. Number of people covered by promotional campaigns. Number of copies of promotional materials designed and disseminated.	Ministry of Tourism	Innovation Fund Research and Scientific Institutions	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget NTO	Empowering local communities and small businesses.
Promote sustainable tourism practices	Q2 2028	2037	N Number of completed promotional campaigns. Number of people covered by promotional campaigns. Number of copies of promotional materials designed and disseminated.	Ministry of Tourism	Municipalities National Tourism Organization Tourist organizations at the local level Tourist Associations	50.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's Budget NTO	Empowering local communities and small businesses. Contribution to environmental protection.

Strategic objective	**TSO 3. Establishing/strengthening multi-sector coordinated approaches and mechanisms to strengthen preparedness for early warning and planning for climate change.**
Operational objective	**TOO 3.1 Improve coordination between climate services (climate services should provide relevant and timely information on climate risks and impacts to the tourism sector).**
Measures	**T3.1.1 Upgrade early warning systems for tourism business and users and implement awareness program about high/value products of small climate impact.**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Appoint a focal point and form a working group.	Q1 2026	Q2 2026	Appointed focal point. The working group formed. Number of members in the working group. Number of institutions represented in the working group	Ministry of Tourism	Ministry of Tourism Ministry of Education, Science and Innovation Institute for Hydrometeorology and Seismology Research and scientific institutions National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for mobilization of funds from various sources.
Assess the existing capacities for the early warning system in the sector and the level of integration into the national system.	Q2 2026	Q4 2026	The research report prepared, verified and adopted.	Working Group Ministry of Tourism	Ministry of Interior Ministry of Tourism Ministry of Education, Science and Innovation Institute for Hydrometeorology and Seismology Research and scientific institutions	Not necessary	Not necessary	Strengthened cross-sectoral cooperation.
Define the scope, objectives and key indicators of the early warning system.	Q2 2026	Q4 2026	Scope, objectives and key indicators defined, verified and adopted.	Working Group Ministry of Tourism	Ministry of Tourism Ministry of Education, Science and Innovation Institute for Hydrometeorology and Seismology	Not necessary	Not necessary	Strengthened cross-sectoral cooperation.

Develop educational/ training programs to raise awareness about the early warning system in the tourism sector.	Q2 2027	Q4 2027	Number of conducted training events. Number of training participants. Number of institutions involved in the training program.	Working Group Ministry of Tourism	Ministry of Education, Science and Innovation Educational institutions	20.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Strengthened cross-sectoral cooperation.

Sector:	**Cross-cutting measures**
Strategic objectives	**CCSO 1. Support gender equality and vulnerable groups through collection and monitoring of disaggregated data.**
Operational objective	**CCOO 1.1 Collection of disaggregated data**
Measures	**CC1.1.1 Create robust procedures for data collection, monitoring and reporting across sectors, with a data management database to ensure availability of data for planning, policy and programming**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Involve stakeholders to assess the state of data and procedures for their collection, storage and use.	Q1 2026	Q4 2026	A working group formed and operational.	Ministry of Ecology, Sustainable Development and Northern Region Development	MONSTAT Institute for Hydrometeorology and Seismology, National Council for Sustainable Development CBIT project	Not necessary	Not necessary	Strengthened cross-sectoral cooperation.
Assess the state of data and procedures for their collection, storage and use.	Q2 2026	Q4 2026	A report on the state of data prepared, verified and adopted.	Working Group Ministry of Ecology, Sustainable Development and Northern Region Development	MONSTAT National Council for Sustainable Development CBIT Project	Not necessary	Not necessary	Strengthened cross-sectoral cooperation.

Define the general and specific objectives and scope of the data management system.	Q2 2026	Q4 2026	Objectives defined, verified and adopted.	Ministry of Ecology, Sustainable Development and Northern Region Development	MONSTAT National Council for Sustainable Development CBIT Project	15.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Strengthened cross-sectoral cooperation.
Detail, identify and agree on new data-related processes and organizational structure for monitoring, reporting and verification.	Q2 2026	Q4 2026	Document with processes and procedures prepared, verified and adopted.	Ministry of Ecology, Sustainable Development and Northern Region Development	MONSTAT National Council for Sustainable Development CBIT Project	30.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Strengthened cross-sectoral cooperation.
Define key indicators and data sets, collect data and create passports of Indicators.	Q2 2026	Q4 2026	Indicators defined, verified and adopted. Passport indicators prepared.	Ministry of Ecology, Sustainable Development and Northern Region Development	MONSTAT National Council for Sustainable Development CBIT Project	10.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Strengthened cross-sectoral cooperation.
Create a database and carry out piloting.	Q1 2027	Q4 2027	The database is up and running.	Ministry of Ecology, Sustainable Development and Northern region Development	MONSTAT National Council for Sustainable Development CBIT Project	25.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Strengthened cross-sectoral cooperation. Contribution to science, research and innovation. Strengthened the capacity to mobilize funds from international sources.

Develop data management capacities.	Q1 2027	Q4 2027	Number of conducted training events. Number of training participants. Number of institutions involved in the training program.	Ministry of Ecology, Sustainable Development and Northern Region Development	MONSTAT National Council for Sustainable Development CBIT Project	20.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Strengthened cross-sectoral cooperation. Contribution to science, research and innovation. Strengthened the capacity to mobilize funds from international sources.

Operational objective	**CCOO 2.1 Improve inter-sectoral collaboration to tackle climate change in a just and equitable way.**
Measures	**CC2.1.1 Inter-sectoral programming to integrate Agriculture, Tourism, Health and Water Sectors planning, with a shared flagship program tackling climate risks across the sectors.**

Activities	Start date	End date	Process indicator	Responsible entity	Implementation partners	Budget (€)	Financing source	Co-benefits
Form a project team.	Q1 2026	Q2 2026	The team formed and operational.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Establish a coordination mechanism between relevant stakeholders.	Q2 2026	Q2 2026	Coordination mechanism defined, verified, adopted and operational.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	Not necessary	Not necessary	Strengthened cross-sectoral cooperation.

Conduct an integrated climate risk assessment.	Q2 2026	Q1 2027	Integrated Climate Risk Assessment Report prepared, verified and adopted.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	30.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Enhancing economic stability through risk reduction. Contribution to social cohesion.

Measures	**CC2.1.2 Improve communication structures between the scientific/ research community, public institutions responsible for planning, and the commercial sector and establish an intersectoral body and processes regarding climate change**							
Activities	**Start date**	**End date**	**Process indicator**	**Responsible entity**	**Implementation partners**	**Budget (€)**	**Financing source**	**Co-benefits**
Form a team and define the tasks and responsibilities of the project.	Q1 2026	Q2 2026	A team set up and operational.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Conduct an analysis of key stakeholders from the research community, public institutions and the business sector for each priority sector.	Q1 2026	Q2 2026	Stakeholder analysis prepared, verified and adopted.	Working Group Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation.

Organize workshops for each sector every 6 months and report on them regularly.	Q1 2027	2030	Number of workshops organized. Number of workshop participants. Number of institutions involved in the workshops.	Working Group Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.
Monitor and evaluate the effects of meetings and monitor actions and outcomes (monitoring and evaluation).	Q1 2027	2035	Reports on the outcome of meetings (minutes) prepared, verified and adopted.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from various sources.

Measures	**CC2.1.4 Educational programs in schools, higher education (University/LLLs), and relevant sectoral institutions, that raise levels of awareness, capacity and preparedness of climate change and its impact.**							
Activities	**Start date**	**End date**	**Process indicator**	**Responsible entity**	**Implementation partners**	**Budget (€)**	**Financing source**	**Co-benefits**
Assemble a team consisting of stakeholders from several institutions from different levels of the education system and key sectoral institutions.	Q1 2026	Q1 2026	A team set up and operational.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development Ministry of Education, Science and Innovation Educational institutions	Not necessary	Not necessary	Encouraging inter- and cross-sectoral cooperation. Support for the mobilization of funds from

								various sources.
Recognize the key shortcomings in the existing education system and relevant institutions with regard to climate change, in particular adaptation.	Q2 2026	Q4 2026	Report on the analysis of the education system prepared, verified and adopted.	Working Group Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development Ministry of Education, Science and Innovation Educational Institutions	Not necessary	Not necessary	Contribution to education.
Develop a plan for the future educational program and capacity building.	Q2 2026	Q4 2026	The plan is prepared, verified and approved.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development Ministry of Education, Science and Innovation Educational Institutions	18.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Contribution to education.
Develop a monitoring and evaluation framework.	Q4 2026	Q1 2027	Monitoring and evaluation framework prepared, verified and adopted.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development Ministry of Education, Science and Innovation Educational Institutions	15.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Contribution to education.
Create an awareness campaign.	Q4 2026	Q2 2027	The number of promotional campaigns carried out. Number of people covered by promotional campaigns. Number of promotional materials designed and disseminated.	Ministry of Ecology, Sustainable Development and Northern Region Development	National Council for Sustainable Development Ministry of Education, Science and Innovation Educational institutions	10.000	Donor funds (IPA, Adaptation Fund, GCF) The Ministry's budget	Contribution to education. Contribution to environmental protection.

Appendix B: Priority adaptation measures

Agriculture: priority adaptation measures

A2.1.1.	Raise capacities and awareness on combined production practices
Measure Type	Capacity development and Institutional strengthening
Opis	Combined production practices can refer to a range of techniques/strategies that farmers can apply to reduce their vulnerability to climate hazards, by providing a buffer/alternative income stream if the dominant crop/livestock production experiences failure due to adverse weather events. These can include options such as cultivation of different crops in the same field, varieties of the same crop with different life cycles, mixing crop and animal farming, diversification of systems, and can be conducted both within farm or between farms (in which case the whole landscape becomes a combined production area).Combined practices generate additional benefits for the protection of biodiversity and ecosystem services, as well as the preservation of landscape and reducing negative impacts on soil, water and air. Through this measure, the awareness of advantages of buffering the impacts of climate change by applying combined practices would be raised through targeted capacity building programs for farmers, and lead to the increased uptake of these practices across Montenegro. In addition, alternative sources of income through rural tourism will be promoted further, on the basis of the existing support measures. **The measure will consist of the following steps:** Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. ● Perform an in-depth analysis of suitability for combined agricultural practices in relation to natural (climate, topography, soils, crop varieties and livestock breeds) and socio-economic (type of agriculture (subsistence/market oriented), demography, educational and capacity level, poverty, markets, institutional setup, access to knowledge-based resources, tourism potential) circumstances across Montenegro, as a basis for targeted capacity building programs. ● Develop a targeted capacity building program on combined agricultural production for farmers, including extension services and municipal agricultural advisory services and other agricultural stakeholders (distributors, consumers). ● Implement targeted training programs ● Develop and implement an accompanying public campaign targeting farmers, consumers and tourism sector (development and dissemination of promotional materials on combined agricultural practices for different stakeholder groups, media campaigns, engagement with tourism sector). ● Develop guidelines on rural tourism as an alternative/supplementary income stream that provides buffer against climate change impacts on agricultural production. The implementation of this measure is closely linked with the capacity building for and enforcement of the Good Agricultural Practices.
Vulnerability / Risk Addressed	Increase in mean annual temperatures Decrease in annual rainfall Increased occurrence of hailstorms and strong winds Increased incidence of droughts Increased exposure to floods in lowland areas Plant diseases Soil warming Production characterized by the use of inadequate crop varieties and hybrids and poor implementation of agrotechnical measures Unfavorable structure of agricultural holdings Ageing population of farmers Weak information basis on all aspects of agriculture Unsuitable capacity building programs

<table>
<tr><td></td><td>Low adaptive capacity of farmers
Lack of relevant knowledge of stakeholders
General lack of awareness of climate change and its impacts
Social and cultural barriers that slow down the acceptance of new knowledge and skills
Development of rural tourism increases the demand for locally grown agricultural products</td></tr>
<tr><td>Strategic and Operational Objectives Supported</td><td>ASO 2. Capacity building on climate change adaptation in order to provide a resilient food production system.
AOO 2.1. Raise capacities of farmers to adapt to climate change</td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>Strategy for Development of Agriculture and Rural Areas 2023-2028 (draft)
Operational Objective 1, 5, 6, 7, 9 & 10
Strategy of Rural Tourism with Action Plan until 2025 (draft)
Operational Objective 2, 3, 4 & 7
Agro-budget 2023
Measures 1.2.1, 2.1.14, 2.2.2, 2.2.3, 2.3.1
Strategy for Circular Transition until 2030
Strategic objectives 1,3</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Gender aspect will be incorporated into targeted capacity building programs. Participation of minimum 30% of women into training sessions will be secured. Female extension workers will be additionally trained to provide support and information to women farmers, as well as to incorporate gender-sensitive messaging in extension materials. Also, the participation of women in leadership roles within farmer groups and cooperatives will be encouraged through trainings on leadership skills, decision-making, and advocacy.</td></tr>
<tr><td>Status of Preparation</td><td>Under implementation to be scaled up/expanded</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Perform the analysis of suitability of combined agricultural practices (baseline study)</td><td>2 years</td><td>Ministry of Agriculture, Forestry and Water Management
Research institutions
Extension services and municipal advisory services
Farmers’ Associations</td></tr>
<tr><td>Develop targeted capacity building programs</td><td>1 year</td><td>Ministry of Agriculture, Forestry and Water Management
Extension services
Secondary and tertiary educational institutions
Farmers Associations</td></tr>
<tr><td>Implement targeted capacity building programs</td><td>2 years</td><td>Ministry of Agriculture, Forestry and Water Management
Extension services
Educational institutions
Farmers Associations</td></tr>
<tr><td>Develop and implement public campaign</td><td>3 years</td><td>Ministry of Agriculture, Forestry and Water Management</td></tr>
<tr><td>Develop and disseminate guidelines for tourism sector</td><td>2 years</td><td>Ministry of Agriculture, Forestry and Water Management
Ministry of Tourism, Ecology, Sustainable Development and Northern Region Development</td></tr>
</table>
</td></tr>
<tr><td>Measures Owner(s)</td><td>Ministry of Agriculture, Forestry and Water Management
Ministry of Ecology, Sustainable Development and Northern region Development</td></tr>
</table>

	Ministry of Tourism

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Baseline study on combined agricultural practices						
Development of targeted capacity building programs						
Implementation of capacity building programs						
Develop and implement public campaign						
Develop and disseminate guidelines for tourism sector						

Stakeholders

Stakeholder group	Engagement
Ministry of Agriculture, Forestry and Water Management	Mainstream combined agricultural practices into agricultural policy Oversee the development and implementation of capacity building programs Provide data and inputs for the process
Extension/advisory services	Provide data Participate in capacity building programs Conduct capacity building programs Mainstream findings into their advisory work
Research institutions	Perform scientific studies Provide data and inputs for the process
Educational institutions	Endorse and implement capacity building programs
Farmers' associations	Participate in capacity building programs Provide information and inputs Implement combined practices
Ministry of Tourism	Integrate combined practices into rural tourism policy. Provide data and input information for rural tourism guidelines. Participate in the public campaign.
Institute for Hydrometeorology and Seismology	Provide data and input information relevant for rural tourism and agriculture, conduct analyses, studies and surveys in the field of climate and climate change, and from other spheres of competencies of the IHMS (water, air and water quality, hydrography, oceanography and seismology), participate in the public consultation.

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
940.000	560.000	-

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	NAPOMENA:
Own Source	Ministry of Agriculture Budget National Government Rural Tourism Development Funding (EIP Chapter 27) National Government Biodiversity Funding International Development Partner	20% 20% 10% 50%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these

	Grant			funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.	

Impact Measures (Quantitative and Qualitative Indicators)	• Number of farms applying combined agricultural practices • Area (ha) of agricultural land under combined practices • Average farm income from products of combined agricultural practices • Yield of crops/livestock • Income from tourism services • Percentage of yield loss due to climate impacts • No. Training workshops delivered • No. Stakeholders Engaged		
Co-Benefits	• Diversifying tourism offers • Biodiversity and environmental protection (including the protection of genetic resources) • Reducing gender vulnerabilities • Contributing to the mainstreaming of the circular economy concept		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation Options**
	Social	Farmers reluctant to implement combined production practices	Design and implement awareness raising programs. Develop an incentive scheme for within farm combined production practices
		Farmers reluctant to cooperate with other farms for combined practices	Design and implement awareness raising programs. Develop an incentive scheme for between farm combined production practices
	Environmental	Inappropriate application of practices causes soil degradation and increased emissions	Develop and implement targeted capacity building programs for extension services and farmers. Better enforcement of soil management regulations and principles of Good Agricultural Practices
	Economic	Combined production reduces quantities of individual crops/livestock products	Raise awareness of consumers in order to strengthen the market for products from combined practices. Increase the participation of products in the tourism and catering sectors
		Combined practices require new investments (funds and labour)	Develop targeted incentive scheme

A3.1.1.	**Enhancing the application of climate-smart agrotechnical measures**
Measure Type	Technical measures, Capacity building and Institutional strengthening
Description	It is important to increase the resilience of agricultural practices and systems to climate hazards, both those that have a fast onset (storms, floods) and slow onset (raising temperatures, decreasing precipitation). This can be achieved through application of climate-smart agro-technical measures that are appropriate for the given context, and can be short term measures (such as protective nets, greenhouses, drip irrigation, field dredging, integrated pest management, shelter for livestock etc) or long term measures (switching to more heat and drought tolerant varieties/breeds, optimizing crop calendars, changing cropping patterns, targeted soil management practices, development of wind and firebreaks, construction of water reservoirs etc).

Description	The basis for the application of such measure already exists (through specific lines of the Agro-budget and other programs), but their implementation is limited due to various factors (high costs of installation and maintenance, lack of capacities, lack of suppliers, limited knowledge base etc.), and should be enhanced, as well as complemented with the contemporary IT-assisted solutions. Through this measure, the implementation of climate-smart practices as well as the knowledge of different options will be enhanced, as well as the awareness and capacities of both policy makers and producers to mainstream and implement them. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. **This measure will consist of the following steps:** ● Assessment of human, technical and financial capacities of policy makers and agricultural producers for mainstreaming and implementing the appropriate climate smart practices and identification of barriers to implementation of such practices. ● Development and implementation of targeted capacity building programs for decision makers, extension/advisory services and agricultural producers on the implementation of climate smart practices. ● Conduct research (market analysis) to make the business case for insurance companies as well as businesses that supply and maintain the specific infrastructure (e.g. protective nets, irrigation systems etc.). ● Piloting innovative climate smart measures with the help of IT technologies (e.g. drone monitoring, real time monitoring, precision agriculture etc.) ● Enhance appropriate policy instruments for supporting and financing the introduction of climate smart practices (mainstreaming into policy and financial incentives).
Vulnerability / Risk Addressed	Increase in mean annual temperatures Decrease in annual rainfall Increased occurrence of hailstorms and strong winds Increased incidence of droughts Increased exposure to floods in lowland areas Plant diseases Soil warming Variable topography and high percentage of land on slopes Agriculture conducted mostly in the open air and thus exposed to weather impacts Agricultural production in some parts limited by water availability Production characterized by the use of inadequate crop varieties and hybrids and poor implementation of agritechnical measures Weak information basis on all aspects of agriculture Unsuitable capacity building programs Infrastructure for animal husbandry inappropriate for heat waves and extreme weather events. Irrigation infrastructure very limited Poor enforcement of soil management policies Low adaptive capacity of farmers Lack of relevant knowledge of stakeholders General lack of awareness of climate change and its impacts Social and cultural barriers that slow down the acceptance of new knowledge and skills
Strategic and Operational Objective Supported	**ASO 3.** Designing and implementing adaptive agriculture practices and measures resulting in maintenance of yields, diversification, soil, water and ecosystem services preservation. **AOO 3.1.** Ensure minimal losses of yields though implementation of adequate technical measures
Linkage to Existing Policies/Plans	Strategy for Development of Agriculture and Rural Areas 2023-2028 (draft) Operational objectives 1, 5, 6, 10, 13

	Agro-budget 2023 Measures 2.1.3, 2.1.5, 2.1.10, 2.1.14, 2.2.1, 2.2.2. 2.2.3.
Gender and Equity Considerations and Implications	Gender assessment will be the integral part of the assessment of human, technical and financial capacities of policy makers, as well as of the targeted capacity building program. It will also ensure that the piloting of innovative climate-smart measures considers the specific needs and preferences of women farmers. The financial incentives for adopting climate-smart practices will be designed in a way that benefits both women and men equally and addresses existing gender disparities.
Status of Preparation	Under implementation to be scaled up/expanded

Implementation Process and Timeline

Korak	Trajanje	Nosilac zadatka / Potrebna podrška
Assessment of capacities	2 years	Ministry of Agriculture, Forestry and Water management Research institutions Extension services
Develop and implement targeted capacity building programs for stakeholder groups	4 years	Extension services Educational institutions Farmers' associations
Conduct market research	2 years	Research institutions
Pilot and promote innovative climate smart measures	3 years	Tehnopolis Research institutions
Enhance policy instruments for climate-smart practices	3 years	Ministry of Agriculture, Forestry and Water management Extension services

Measures Owner(s)	Ministry of Ecology, Sustainable Development and Northern Region Development, Extension services, Ministry of Agriculture, Forestry and Water Management

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Assessment of capacities						
Capacity building programs						
Market research						
Piloting innovative climate smart approaches						
Enhancing the policy instruments						

Stakeholders

Stakeholder group	Engagement
Ministry of Agriculture, Forestry and Water Management	Enhance the agricultural policy in relation to climate smart agricultural practices Oversee the development and implementation of capacity building programs Provide data and inputs for the process
Extension/advisory services	Provide data Participate in capacity building programs Provide adequate advice and support to farmers
Research institutions	Perform research Provide data and inputs Develop guidelines
Educational institutions	Develop capacity building programs
Farmers' associations	Participate in capacity building programs Provide information and inputs Implement climate smart measures
Private Companies	Provide data for market analysis Participate in capacity building programs Start offering services and climate smart solutions

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
1,360,000	460.000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	NOTE:
Own Source Concessional loan Equity	Ministry of Agriculture Budget International Development Partner Private Sector	40% 40% 20%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.

Impact Measures (Quantitative and Qualitative Indicators)

- Number of farms applying climate smart measures
- Area (ha) of agricultural land under climate smart measures
- Average farm income from products of climate smart measures
- Yield of crops
- Percentage of yield loss due to climate impacts
- Amount of funds available and utilized for the implementation of climate smart practices
- No. trainings
- No. of stakeholders engaged

Co-Benefits	Biodiversity and environmental protection Reducing gender vulnerabilities		
Potential Project Risks and Mitigation Options	**Potential Project Risks and Mitigation Options**	**Potential Project Risks and Mitigation Options**	**Potential Project Risks and Mitigation Options**
	Social	Farmers reluctant to accept climate-smart measures	Design and implement awareness raising programs. Develop an incentive scheme for climate smart practices
	Environmental		
	Economic	Lack of incentives and financing opportunities for funding climate smart measures	Raise awareness and capacities of policy makers on climate change impacts and mitigation options through climate smart practices. Lobby for the development of incentive schemes. Develop incentive schemes
		Market and user support services (maintenance, insurance) for specific technical measures lacking	Conduct the market research Promote the market for technical measures Provide incentives for local service providers within the agricultural policy
	Other		

A3.1.2.	**Identifying and implementing measures to reduce climate stress on livestock**
Measure Type	Technical measures, Capacity building and Institutional strengthening
Opis	Climate impacts on livestock can be direct and indirect. Direct impacts are primarily heat stress from increased temperatures, affecting animal thermoregulation, metabolism, immune system function and reproduction. Indirect effects are related to water availability (due to reduced precipitation and increased frequency and duration of droughts), feed production and increased occurrence of diseases. All this affects productivity of livestock, and impacts farm income, production outputs, as well as increases emissions from unproductive livestock. Common animal husbandry practices are mostly focused on increasing productivity, but not so much on improving stress resistance, which in turn increased livestock sensitivity, especially in relation to climate change impacts. Adaptation measures to reduce climate stress are various and can include technical measures to improve cooling (construction of shades, appropriate housing, installation of fans and sprinklers), changes in animal management systems (in relation to feed intake and related nutritional interventions, reproductive health, immune responses) as well as genetic interventions through selective breeding. Support for these kinds of measures already exist in Montenegrin agricultural policy, but in practice, they are poorly enforced, primarily due to the lack of funding and awareness at the farm level. Through this measure, the implementation of such measures will be enhanced. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure will follow the following steps: ● Research and analysis to identify the most cost-effective solutions ● Engagement with livestock keepers to better understand how these solutions could be implemented and why they aren't currently being implemented widely. Identifying/shortlisting the solutions most likely to be implemented

	● Perform a long-term cost analysis on shortlisted solutions: Conduct studies to evaluate the long-term economic benefits of climate-sensitive livestock housing and nutritional interventions. This will highlight the potential savings in energy costs, reduced veterinary expenses, improved animal health, and increased productivity. To provide the business case to farmers ● Promote native heat tolerant breeds and establish breeding stocks ● Technical assistance and capacity development: Offering technical guidance and capacity development programs to farmers on the benefits and techniques of climate-sensitive livestock housing and nutritional interventions ● Prepare a feasibility study on the local production of animal feed (sowing of appropriate crops, development of feed micro-processing facilities) ● Establishing financial incentives such as low-interest loans ● Enhancing the policy and legislative framework to better support and if needed, enforce, the adoption of the measures
Vulnerability / Risk Addressed	Increase in mean annual temperatures Increased incidence of droughts Livestock diseases Agriculture conducted mostly in the open air and thus exposed to weather impacts Low adaptability of bee keeping sector Production characterized by the use of inadequate crop varieties and hybrids and poor implementation of agritechnical measures Weak information basis on all aspects of agriculture Unsuitable capacity building programs Infrastructure for animal husbandry inappropriate for heat waves and extreme weather events. Low adaptive capacity of farmers Lack of relevant knowledge of stakeholders General lack of awareness of climate change and its impacts Social and cultural barriers that slow down the acceptance of new knowledge and skills
Strategic and Operational Objective Supported	**ASO 3.** Designing and implementing adaptive agriculture practices and measures resulting in maintenance of yields, diversification, soil, water and ecosystem services preservation. **AOO 3.1.** Ensure minimal losses of yields though implementation of adequate technical measures
Linkage to Existing Policies/Plans	Strategy for Development of Agriculture and Rural Areas 2023-2028 (draft) Operational objectives 1, 5, 6, 10, 13 Agro-budget 2023 Measures 1.2.1, 2.1.5, 2.1.14, 2.2.1, 3.2, 8
Gender and Equity Considerations and Implications	Within the research and analysis of the most cost-effective solutions, a gender analysis will be incorporated to understand how climate stress affects women livestock keepers differently from men. Women livestock keepers will be included in consultations and engagement activities to better understand their perspectives and constraints in implementing climate-sensitive solutions. Within the long-term cost analysis, evaluate the economic benefits of climate-sensitive livestock interventions for women livestock keepers. Female extension workers and women livestock keepers will be included into capacity development and technical assistance programs. Gender assessment will be included in the feasibility study on animal feed. Financial incentives such as low-interest loans will be accessible to women livestock keepers who are not able to secure any collateral.
Status of Preparation	Under implementation to be scaled up/expanded

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Research and analysis	2 years	Research institutions Extension services
Engagement with cattle keepers	3 years	Extension services Ministry of Agriculture, Forestry and Water Management Farmers' associations
Business case development / Long-term cost analysis	1 year	Research institutions
Technical assistance and capacity development	3 years	Extension services educational institutions
Establishing enabling environment: policy, legislative and financial instruments	2 years	Ministry of Agriculture, Forestry and Water Management
Feasibility study on the local feed production	2 years	Research institutions Extension services Farmers' associations

Measures Owner(s)

Ministry of Ecology, Sustainable Development and Northern Region Development
Extension and municipal advisory services
Ministry of Agriculture, Forestry and Water management

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Research and analysis						
Engagement with cattle keepers						
Business case development / Long-term cost analysis						
Technical assistance and capacity development						
Establishing enabling environment: policy, legislative and financial instruments						
Feasibility study on the local feed production						

Stakeholders

Stakeholder groupa	Engagement
Ministry of Agriculture, Forestry and Water Management	Enhance the existing and develop new policy measures Oversee the development and implementation of capacity building programs Provide data and inputs for the process
Extension and municipal advisory services	Provide data Participate in capacity building programs Conduct capacity building programs
Research institutions	Provide data and inputs for the process Develop guidelines
Educational institutions	Develop and endorse capacity building programs
Farmers' associations	Participate in capacity building programs Provide information and inputs Implement livestock resilience measures

<table>
<tr><td>Indicative costs</td><td colspan="3"><table>
<tr><th>CapEx [€]</th><th>OpEx over 5 years [€]</th><th>Development / Advisory Costs [€]</th></tr>
<tr><td>896.000</td><td>524.000</td><td>-</td></tr>
</table></td></tr>
<tr><td>Potential Financing Instruments and Sources</td><td colspan="3"><table>
<tr><th>Instrument (Own-Source, Grant, Debt, Equity, Other)</th><th>Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other</th><th>Amount € / Share %</th><th>NOTE:</th></tr>
<tr><td>Own Source

Grant</td><td>Ministry of Agriculture Budget

International Development Partner</td><td>30%

70%</td><td>In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD.
The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.</td></tr>
</table></td></tr>
<tr><td>Impact Measures (Quantitative and Qualitative Indicators)</td><td colspan="3">● Number of farms applying appropriate measures
● Number of livestock encompassed by the measures
● Average farm income from livestock products
● Yield of livestock (outputs of animal products)
● Percentage of yield loss due to climate impacts
● Size of native breeds' populations
● Amount of funds available and utilized for the implementation of livestock measures
● No. Training Workshops</td></tr>
<tr><td>Co-Benefits</td><td colspan="3">● Reduced carbon emissions from decreased number of unproductive animals
● Improved animal welfare</td></tr>
<tr><td>Potential Project Risks and Mitigation Options</td><td colspan="3"><table>
<tr><th>Area</th><th>Risks</th><th>Mitigation Options</th></tr>
<tr><td>Social</td><td>Farmers reluctant to accept new livestock measures</td><td>Design and implement awareness raising programs. Develop incentive scheme for livestock resilience practices</td></tr>
<tr><td>Environmental</td><td>Potentially high energy usage</td><td>If additional energy is required for measures, then seek to support farmers to use renewable sources, ideally utilizing circular economy from farm waste e.g. methane etc.</td></tr>
<tr><td>Economic</td><td>Lack of incentives and financing opportunities for funding livestock adaptation measures</td><td>Raise awareness and capacities of policy makers on climate change impacts and mitigation options through livestock adaptation measures. Improve the existing and develop new incentive schemes</td></tr>
</table></td></tr>
</table>

A3.2.1.	**Preservation of hay meadows and pastures and the promotion of sustainable land use practices**
Measure Type	Technical measures, Capacity building and Institutional strengthening
Description	Pastures and hay meadows comprise 87% of total agricultural land in Montenegro, of which more than 90% are natural grasslands. They provide support for the animal-based production which is the most significant component of Montenegrin agriculture. Furthermore, they are an important feature of mountain landscapes as well as areas harboring important biodiversity and cultural heritage, and habitats resilient to extreme weather events. The main issues with pastures and hay meadows in Montenegro is that they are prone to succession due to reduced grazing, land conversion and degradation, fires and increased frequency of weeds and invasive species. They are currently not sufficiently managed, as very few agro-technical measures are being applied, affecting their productivity. The existing policy measure is focused on the upland pastures and consists of direct payments to farmers that spend at least 3 months of the year there and have a minimal number of cattle. However, this measure does not fully address the impacts that climate change has on pastures, nor does it include a wider array of grassland habitats that support animal production. The adaptation measures for pastures and hay meadows can include grazing management (cattle rotation, grazing patterns, making use of underutilized pastures), land restoration, regeneration and rehabilitation of degraded grasslands (through pasture sowing, agroforestry, run-off and erosion control, improvement of water retention), as well as the prevention of further degradation from fires and invasive species (through firebreaks, weeding), which are currently not mainstreamed into Montenegrin agricultural policy. They can also include other forms of support to livestock keepers to maintain upland pastures, such as providing the infrastructure in katuns. This measure will facilitate better understanding of climate change impact on hay meadows and pastures and design of appropriate response. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure will consist of the following: ● Assessment of human, technical and financial capacities of policy makers and farmers for mainstreaming and implementing the appropriate pasture management practices and identification of barriers to implementation of such practices. ● Introduce grazing management measures in pastures (electrical fences, cattle rotation, use of underutilized pastures and hay meadows). ● Perform regional clustering of katuns and provide appropriate support to clusters (e.g. organized cattle transport, electricity supply and solar panel installation, cold storage infrastructure, building of water reservoirs, wells and water filtration systems). ● Development and implementation of targeted capacity building programs for decision makers, extension/advisory services and agricultural producers on the implementation of pasture management practices. ● Enhancement of the existing and development of new policy instruments for supporting and financing the adaptive measures for pastures and hay meadows, including improved support to katuns. This measure is closely linked with the measure AM3.1.2, with which it can be implemented jointly. The measure is complementary with the development and implementation of food quality schemes, through which traditional food technologies are preserved and improved through food safety protocols
Vulnerability / Risk Addressed	Increase in mean annual temperatures on land. Decrease in annual rainfall. Increased incidence of droughts. Variable topography and high percentage of land on slopes. Agriculture conducted mostly in the open air and thus exposed to the weather impacts. Agriculture limited by water availability. General lack of awareness of climate change and its impacts.
Strategic Objective Supported	**ASO 3.** Designing and implementing adaptive agriculture practices and measures resulting in maintenance of yields, diversification, soil, water and ecosystem services preservation. **AOO3.2.** Prevent degradation of natural base of food production system

<table>
<tr><td>Linkage to Existing Policies/Plans</td><td>Strategy for Development of Agriculture and Rural Areas 2023-2028 (draft)
Operational Objectives 1, 5, 6, 7
Agro-budget 2023
Measures 2.2.3, 2.3.1, 3.2
Strategy for Circular Transition until 2030
Strategic objectives 1,3
Links with NAP Measure: AM3.1.2 ‘Identifying and implementing measures to reduce climate stress on livestock’</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Within the assessment of policy makers and farmers, gender -sensitive aspects will be incorporated to understand how gender dynamics influence the adoption of sustainable land management practices by women and men and to address gender-specific barriers that may hinder women farmers' participation in pasture management and sustainable land use initiatives. While planning and implementing financial support to the regional clustering of katuns, the targeted support to women farmers and pastoralists that support their practical needs will be delivered (like cold storage, water reservoirs, etc.), given the fact that women are the main actors in milk and dairy production.</td></tr>
<tr><td>Status of preparation</td><td>Under implementation to be scaled up/expanded</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Korak</th><th>Trajanje</th><th>Nosilac zadatka / Potrebna podrška</th></tr>
<tr><td>Assessment of capacities</td><td>2 years</td><td>Research institutions
Extension and municipal advisory services</td></tr>
<tr><td>Grazing management measures</td><td>5 years</td><td>Extension and municipal advisory services
Farmers’ associations/katun users</td></tr>
<tr><td>Clustering of and support to katuns</td><td>5 years</td><td>Ministry of Agriculture Forestry and Water management
Extension and municipal advisory services
Farmers’ associations/katun users</td></tr>
<tr><td>Develop and implement targeted capacity building programs for stakeholder groups</td><td>5 years</td><td>Extension and municipal advisory services
Educational institutions
Farmers’ associations</td></tr>
<tr><td>Improve the policy framework</td><td>4 years</td><td>Ministry of Agriculture, Forestry and Water management
Extension and municipal advisory services</td></tr>
</table>
</td></tr>
<tr><td>Measures Owner(s)</td><td>Ministry of Ecology, Sustainable Development and Northern Region Development
Ministry of Agriculture, Forestry and Water Management</td></tr>
<tr><td>Timeframe</td><td>
<table>
<tr><th>Activity</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Years 6-10</th></tr>
<tr><td>Assessment of capacities</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grazing management measures</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Clustering of and support to katuns</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Develop and implement capacity building programs</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Improve the policy framework</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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Stakeholders

Stakeholder group	Engagement
Ministry of Agriculture, Forestry and Water Management	Enhance the agricultural policy in relation to adaptive measures Oversee the development and implementation of adaptive measures Ensure the support to katuns in adaptation Provide data and inputs for the process
Extension/advisory services	Provide data Participate in capacity building programs Conduct capacity building programs Provide adequate advice and support to farmers
Research institutions	Perform assessments Provide data and inputs for the process Develop guidelines
Educational institutions	Develop capacity building programs
Farmers' associations/katun users	Participate in capacity building programs Provide information and inputs Implement adaptive practices in katuns

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
1,680,000	670,000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source Grant	Ministry of Agriculture Budget National Government Biodiversity Funding International Development Partner	20% 20% 60%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.

Impact Measures (Quantitative and Qualitative Indicators)

- Total area of pastures and hay meadows/changes in total area;
- Area of pastures and hay meadows under adaptive practices;
- Number of grazing animals on pastures;
- Volumes of hay collected;
- Outputs of grazing animals (dairy and meat);
- No. training workshops;
- No. stakeholders engaged.

Co-Benefits	● Carbon sequestration through better management of grasslands ● Biodiversity protection in grasslands (species' habitats, landscape connectivity) ● Forest fire prevention through prevention of succession and accumulation of fire prone material ● Enhancing the supply of ecosystem services ● Maintains yields during extreme weather events such as floods and droughts.		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation options**
	Social	Farmers reluctant to change grazing practices	Design and implement awareness raising programs. Develop incentive schemes for adaptive grazing practices
		Diminishing number of pastoralists in the upland regions (katuns)	Provide support to katuns (infrastructure etc.)
		Lack of personal incentives and cooperation due to communal nature of pastures and traditional use rights	Establish and support clusters of katuns and associations of katun users. Implement capacity building programs
	Environmental	Overgrazing in certain areas	Monitor and enforce grazeland management
		Increased nutrient inputs from animals into grasslands	Monitor and enforce grazeland management
	Economic	Lack of incentives and financing opportunities for funding adaptive measures	Redesign Agro-budget to include grazeland management, improve infrastructure support to katuns, and supplement funding from other sources

Water: priority adaptation measures

W1.1.1.	**Strengthen the network of measuring stations and improve the monitoring of water related data**
Measure Type	Capacity building, technical measure
Description	Climate prognoses and projections that form a basis for planning in relation to climate hazards, floods included, are based on up-to-date data provided by the monitoring stations in the field. The network of monitoring stations in Montenegro exists, but is deficient in the following ways: ● All the existing meteorological stations are distributed below 1400m altitude, so the system is lacking data related to snowfall, snowmelt and hydrological processes in higher altitudes. ● Network of hydrological stations covers most of the territory, but some smaller basins and flood-prone locations are not covered. ● The locations of hydrological stations have been determined decades ago, in the meanwhile the river bed profiles have shifted due to natural and anthropogenic causes, so the data obtained from these stations can't always produce information upon which predictions of floods and other hydrological processes can be made accurate. In addition to this, Institute for Hydrometeorology and Seismology (as the responsible institution) has limited human resources, especially with regards to skills in data processing. The institute also lack equipment for maintenance of the monitoring stations (vehicles, spare parts, appropriate clothing for the fieldwork). Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. Through this measure, the technical and human capacities for monitoring the water related data will be improved in the following manner: ● Purchase and installation of new meteorological and hydrological monitoring stations (at least 6 of each); ● Performing the geodetic surveys for up-to-date information on the profiles of river channels for purposes of flood monitoring; ● Capacity building for relevant personnel in data storage [AB[2], handing and analysis; ● Purchase relevant fieldwork equipment to strengthen the technical capacities of relevant personnel.

Vulnerability / Risk Addressed	Lack of detailed, specific and quantified data about vulnerability and potentials for adaptation. Lack of knowledge, skills and data of the decision makers and other relevant institutions and other stakeholders. Weak information basis on all aspects of agriculture. A lack of product diversification in the light of climate change.
Strategic and Operational Objectives Supported	**WSO 1**. Improved knowledge base of water resources providing a foundation for capacity building and coordinated intersectoral water management approaches. **WOO 1.1**. Ensure the up-to-date high resolution data as a basis for informed decision making
Linkage to Existing Policies/Plans	National Sustainable Development Strategy Measures 3.1.2, 3.2.4, 3.6.5. Water Strategy – operational objective: Efficient and continuous monitoring and prognoses of hydrometeorological events DRR Strategy – Activity 81
Gender and Equity Considerations and Implications	N/A
Status of Preparation	Under implementation to be scaled up/expanded
Implementation Process and Timeline	

Step	Duration	Task owner / Support required
Purchase and installation of new monitoring stations	2 years	Institute for Hydrometeorology and Seismology Ministry of Tourism, Ecology, Sustainable Development and Northern Region Development Water Administration
Geodetic surveys of river channels	3 years	Water Administration Institute for Hydrometeorology and Seismology
Develop and implement capacity building programs	2 years	Institute for Hydrometeorology and Seismology
Purchase relevant fieldwork equipment	1 year	Institute for Hydrometeorology and Seismology

Measure Owner(s)	Ministry of Ecology, Sustainable Development and Northern Region Development Institute for Hydrometeorology and Seismology
Timeframe	

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Purchase and installation of new monitoring stations						

Geodetic surveys of river channels						
Develop and implement capacity building programs						
Purchase relevant fieldwork equipment						

Stakeholders

Stakeholder group	Engagement
Institute for Hydrometeorology and Seismology	Implementation of all the activities
Water Administration	Data inputs Participation in capacity building Resource mobilization
Ministry of Ecology, Sustainable Development and Northern Region Development	Financial resource mobilization
Ministry of Agriculture, Forestry and Water Resources	Financial resource mobilization

Indicative Costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
€1,950,000	€300,000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	Ministry of Agriculture, Forestry & Water Management Budget (IPA Funding)	30%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Grant	International Development Partner	70%	

Impact Measures (Quantitative and Qualitative Indicators)

- Number of new monitoring stations;
- Monitoring stations installed and operational;
- Number of people attending the capacity building programs;
- Number of river channels surveyed;
- River channel maps produced in digital format and integrated in cadaster and spatial plans;
- Data from new stations integrated in the monitoring system;
- Improved meteo- and hydrological datasets;
- Improved forecasts and projections for planning;

	● Fieldwork equipment purchased and used in the field; ● Number of field visits.		
Co-benefits	Reduced flood risk and relevant health, wellbeing and economic benefits that arise from that risk reduction.		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation options**
	Environmental	River surveys provide a basis for channel regulations through gravel extraction	Performing an environmental impact assessment
	Economic	Not enough funding for purchase and installation of new stations and fieldwork equipment Maintenance of new equipment creates a burden to institution	Financial resource mobilization with the help of relevant ministries Ensure sufficient budget allocations

W1.1.2.	**Upgrading and using existing flood risk mapping to develop interventions that prioritize Natural Water Retention measures**
Measure Type	Policy, Capacity development and Institutional strengthening
Opis	Natural Water Retention Measures (NWRM) are measures that preserve and enhance the water retention capacity of aquifers, soils and ecosystems. They can be achieved through maintenance and restoration of natural aquatic ecosystems (e.g. restoration of riverbanks and wetlands, reconnection of river channels and meanders), as well as through land use planning and interventions (such as the protection and management of forests, afforestation of upstream watershed zones, restoration and maintenance of grasslands, buffer strips, soil management practices, urban forests etc). NWRM are considered to be complementary to classic grey infrastructure for flood protection (dykes, channels and such), but can have a suite of co-benefits such as water quality improvement, groundwater recharge and habitat maintenance. The lack of information on the water land and its absence from cadastre and spatial plans resulted in the deterioration of natural water retention capacity, degradation of habitats, as well as increased flood risk in these areas due to unregulated urbanization. Furthermore, the policy defines the Area of Potential Significant Flood Risk (ASFR) only in the relation to the number of inhabitants or infrastructure in a particular area, so the natural habitats that are flood prone are by such a definition excluded from the flood prevention and mitigation policy and its enforcement. Considering the above, this measure should focus on the mapping/contouring of the “water land”, improvement and better enforcement of policies and plans related to land use in defined ”water land“ areas, with the accompanying capacity building of stakeholders. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure should have the following steps: ● Establish intersectoral coordination mechanism between water and spatial planning sectors (and other relevant sectors) ● Capacity building of decision makers on national and local levels on NWRM and their mainstreaming ● Implement a pilot project, consisting of: delineation and mapping of “water land“, its designation into the municipal spatial plan and land cadastre database, pilot restoration of degraded “water land“ using habitat restoration and other nature based solutions to restore and increase water retention capacity, establishment of a continuous monitoring and evaluation system. ● Suggested pilot areas are rivers Lim and Grncar, where illegal gravel extraction damaged the natural water retention capacity and significantly increased flood risk

<table>
<tr><td></td><td>

Implementation of infrastructural activities is currently ongoing, and these activities are going to provide substantial benefits for improvement of physical conditions and properties of the damaged areas in the Lim Grncar section. Consequently, further implementation of the proposed pilot project is going to ensure that the negative effects on structural properties of the Lim Grncar section are duly mitigated and that further negative impacts caused by climate change and other negative factors are prevented through adaptive planning and development of mitigation measures.
Prepare a feasibility study on upscaling the outcomes of pilot projects to other river basins in the country

NWRM have the potential to provide multiple benefits, including flood risk reduction, water quality improvement, groundwater recharge and habitat improvement. However, enhanced coordination between planning processes across different policy areas (e.g. River Basin Managements Plans and Flood Risk Management Plans, but also nature protection, rural development and land use/spatial planning) is seen as a pre-requisite for enhancing the chances of the multiple benefits of NWRM to be considered appropriately in management decisions.
</td></tr>
<tr><td>Vulnerability / Risk Addressed</td><td>More frequent extreme precipitation;
Sea level rise and storms;
Dependence on groundwater for water supply;
High pressure on water resources from various forms of use;
Inadequately managed land;
Deficient protection of water sources;
Lack of detailed, specific and quantified data about vulnerability and potentials for adaptation;
Lack of knowledge, skills and data of the decision makers and other relevant institutions and other stakeholders.</td></tr>
<tr><td>Strategic and Operational Objectives Supported</td><td>WSO 1. Improved knowledge base of water resources providing a foundation for capacity building and coordinated intersectoral water management approaches.
WOO 1.1. Ensure the up-to-date high-resolution data as a basis for informed decision making</td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>Water Strategy – Operational objective „Adequate use of „water soils“ and potential flood zones “
Operational objective “Maintenance of water course in regard to the environment”

National DRR Strategy – actions 7-11, 17, 20, 25, 45, 94, 105

National Sustainable Development Strategy – measure 3.6.5.</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Intersectoral coordination mechanism will ensure the inclusion of gender perspectives and equal participation of women and men in decision-making processes. Gender perspective will be integrated into capacity building for decision makers at national and local levels. The pilot project will consider the specific impacts on women, men and vulnerable groups. Gender-disaggregated data to assess the impact of the interventions on different genders will be integrated into continuous monitoring and evaluation system. A feasibility study on scaling up the results of pilot projects to other river basins in the country will ensure that gender considerations are integrated throughout the process.</td></tr>
<tr><td>Status of Preparation</td><td>Under implementation to be scaled up/expanded.</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Establish intersectoral coordination body. This activity is reflected in the activation of the NCSD Working Group responsible for climate change and for ensuring the integration of this issue into the work plan, as well as for the formation of a technical working group under the auspices of the NSSD.</td><td>1 year (then continuous)</td><td>Ministry of Agriculture, Forestry and Water Management (Directorate for Water Management),
Water Administration
Directorate for Spatial Planning (Ministry of Spatial Planning, Urbanism and State Property)
Directorate for protection and Rescue (Ministry of Interior)
Target municipalities
Institute for Hydrometeorology and Seismology</td></tr>
</table>
</td></tr>
</table>

	Develop and implement capacity building programs	2 years	Water Administration, Educational institutions
	Identify, develop and implement pilot project	5 years	Target locations: rivers Lim and Grncar
	Establish a monitoring and evaluation system for the pilot project	Continuous	Target municipalities (Gusinje, Berane) Water Administration
	Prepare a feasibility study on upscaling the pilot project to the national level	2 years	Water Administration Research institutions

Measure Owner(s)

Ministry of Ecology, Sustainable Development and Northern Region Development.
Ministry of Agriculture, Forestry and Water Management
Water Administration

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Establish intersectoral coordination body						
Develop and implement capacity building programs						
Identify, develop and implement pilot project						
Establish a monitoring and evaluation process for the pilot areas						
Prepare a feasibility study on upscaling the pilot project						

Stakeholders

Stakeholder group	Engagement
Ministry of Agriculture, Forestry and Water Management	Lead the establishment of the intersectoral coordination body Oversee the coordination mechanism Provide data Participate in capacity building
Water Administration	Participate in the intersectoral cooperation body Oversee the implementation, monitoring and evaluation of pilot projects Provide data Participate in capacity building
Ministry of Spatial Planning, Urbanism and State Property	Participate in the intersectoral coordination body Mainstream NRWM into spatial planning policy Provide data Participate in capacity building
State Property Administration	Participate in the intersectoral coordination body Mainstream NRWM into cadastre Provide data Participate in capacity building
Cadastre Administration	

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
€1,048,000	€622,000	-

<table>
<tr><td>Potential Financing Instruments and Sources</td><td>
<table>
<tr><th>Instrument (Own-Source, Grant, Debt, Equity, Other)</th><th>Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other</th><th>Amount € / Share %</th><th>Note</th></tr>
<tr><td>Own Source</td><td>Ministry of Agriculture, Forestry & Water Management Budget (IPA Funding)</td><td>90%</td><td rowspan="2">In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD.
The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.</td></tr>
<tr><td></td><td>International Development Partner</td><td>10%</td></tr>
</table>
</td></tr>
<tr><td>Impact Measures (Quantitative and Qualitative Indicators)</td><td>
− Intersectoral cooperation body established
− Capacity building program developed and implemented
− Number of participants and institutions in the capacity building program
− Pilot projects for the Lim and Grncar rivers developed and implemented (land soil contoured and entered into the cadastre and municipal plans, field interventions carried out)
− No. follow-on projects identified and implemented
</td></tr>
<tr><td>Co-benefits</td><td>
− Water quality improvement;
− Groundwater recharge;
− Habitat and biodiversity protection.
</td></tr>
<tr><td>Potential Project Risks and Mitigation Options</td><td>
<table>
<tr><th>Area</th><th>Risks</th><th>Mitigation Options</th></tr>
<tr><td rowspan="2">Social</td><td>Stakeholders' lack of willingness to cooperate</td><td>Demonstrate the benefits from NWRMs through cost-benefit analysis</td></tr>
<tr><td>Lack of human capacities in relevant institutions (e.g. Water Administration)</td><td>Provide technical support for pilot projects from external funds</td></tr>
<tr><td>Environmental</td><td>Impact to natural habitats of pilot project interventions</td><td>Ensure sound impact assessment in the pilot project development phase. If necessary, train the implementing company in biodiversity protection</td></tr>
<tr><td>Economic</td><td>High economic costs of restoration of pilot areas</td><td>Ensure financial mechanisms through utilization of international funds</td></tr>
</table>
</td></tr>
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W2.1.1.	**Improve capacities of policy makers and strengthen the research and management capacities. To assess the occurrence and risk of adverse impacts of climate change and adaptation of freshwater systems**
Measure Type	Capacity building and Institutional Strengthening
Description	The analysis so far identified the following main focus areas in which capacities should be improved within the water sector – knowledge of staff on climate change adaptation and its mainstreaming into policies and decision-making process, skills related to data acquisition, management and use, and technical capacities in terms of hardware and software for data storage, analysis and use. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption).

<table>
<tr><td></td><td>One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured.
This measure will include the following activities:
- Develop and implement a targeted training program on climate change adaptation for water sector policy makers
- Develop and implement a targeted training program for data acquisition, analysis and use (particular focus on GIS) for the use in water sector and cadastre planning, programs and projects
- Acquire and install appropriate hardware and software in relevant institutions and train staff in their usage
The measure should be aligned with the process of implementation of the INSPIRE Directive, which is ongoing in Montenegro, and in coordination with the measure WM1.1.1.</td></tr>
<tr><td>Vulnerability / Risk Addressed</td><td>Lack of detailed specific and quantified data about vulnerability and potentials for adaptation
Deficient water management system
Lack of knowledge, skills and data of the decision makers and other relevant institutions and other stakeholders</td></tr>
<tr><td>Strategic and Operational Objectives Supported</td><td>WSO 2. Improved capacities for preparation and response to extreme hydrological weather events to reduce injury, deaths and infrastructure damages.

WSO 2.1. Build capacities for integration of climate risks into planning</td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>Water Strategy -development of the water information system

DRR Strategy - measures 15, 17, 20, 36, 45, 54, 94

National Sustainable Development Strategy – Measure 4.1.1.

Cross-Cutting NAP Measure: CC2.1.4 Educational Programs in schools, higher education (University/LLLs), and relevant sectoral institutions, that raise levels of awareness, capacity and preparedness of climate change and its impact</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Gender perspectives will be incorporated into training program for policy makers to address the specific needs and roles of women and men in climate change adaptation efforts. Specific needs and roles of vulnerable groups will also be included. Different impacts on women and men and promotion of equal participation and opportunities for both genders will also be applied within the training program for data acquisition, analysis, and use in water sector and cadastre planning, programs, and projects, as well as in the trainings for the use of new technologies for institutions.</td></tr>
<tr><td>Status of Preparation</td><td>Under implementation to be scaled up/expanded.</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Develop targeted training program on climate change adaptation for water sector policy makers</td><td>2 years</td><td>Ministry of Ecology, Sustainable Development and Northern Region Development,
Water Administration
Educational institutions</td></tr>
<tr><td>Implement targeted training program on climate change adaptation for water sector policy makers</td><td>5 years</td><td>Ministry of Ecology, Sustainable Development and Northern Region Development,
Water Administration
Educational institutions
Ministry of Agriculture, Forestry and Water Management</td></tr>
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</table>

	Develop a targeted training program for data acquisition, analysis and use	2 years	Ministry of Ecology, Sustainable Development and Northern Region Development, Water Administration Educational institutions Ministry of Agriculture, Forestry and Water Management
	Implement a targeted training program for data acquisition, analysis and use	5 years	Ministry of Ecology, Sustainable Development and Northern Region Development, Water Administration Educational institutions Ministry of Agriculture, Forestry and Water Management
	Acquire and install appropriate hardware and software in relevant institutions	2 years	Ministry of Ecology, Sustainable Development and Northern Region Development, Water Administration Educational institutions Ministry of Agriculture, Forestry and Water Management

Measures Owner(s)

Ministry of Ecology, Sustainable Development and Northern Region Development
Ministry of Agriculture, Forestry and Water Management
Water Administration
Human Resources Management Authority
State Property Administration
Cadastre and State Property Administration

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Develop program for policy makers						
Implement program for policy makers						
Develop program on data use						
Implement program on data use						
Acquire relevant hardware and software						

Stakeholders

Stakeholder group	Engagement
Ministry of Agriculture, Forestry and Water Management	Participate in the development and implementation of the training program
Water Administration	Participate in the development and implementation of the training program Purchase and use the relevant IT equipment
Human Resources Management Authority	Participate in the development and implementation of the training program Integrate the training program in the national human resources capacity building system

<table>
<tr><td>Indicative Costs</td><td>CapEx [€]</td><td>OpEx over 5 years [€]</td><td>Development / Advisory Costs [€]</td></tr>
<tr><td></td><td>€844,000</td><td>€616,000</td><td></td></tr>
<tr><td>Potential Financing Instruments and Sources</td><td colspan="3">
<table>
<tr><th>Instrument (Own-Source, Grant, Debt, Equity, Other)</th><th>Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other</th><th>Amount € / Share %</th><th></th></tr>
<tr><td>Own Source</td><td>Ministry of Agriculture, Forestry & Water Management Budget (IPA Funding)</td><td>70%</td><td rowspan="2">In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD.
The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.</td></tr>
<tr><td>Grant</td><td>International Development Partner</td><td>30%</td></tr>
</table>
</td></tr>
<tr><td>Impact Measures (Quantitative and Qualitative Indicators)</td><td colspan="3">

Training program developed and implemented;
Number of participants and institutions in the training program;
Relevant IT equipment purchased and installed;
Training program integrated in the capacity building system of the Human Resources Management Authority;
Georeferenced database (including information on river basins, flood maps, water source protection zones, erosion risk zones, NWRM and other);
Georeferenced data mainstreamed into cadastre and spatial plans.

</td></tr>
<tr><td>Potential Project Risks and Mitigation Options</td><td colspan="3">
<table>
<tr><th>Area</th><th>Risks</th><th>Mitigation options</th></tr>
<tr><td>Social</td><td>Lack of interest of staff in participating in the capacity development program</td><td>Ensure the program is integrated in the capacity building system of the Human Resources Management Authority</td></tr>
<tr><td>Economic</td><td>Lack of funding for the purchase of the IT equipment</td><td>Ensure resource mobilization from international funds</td></tr>
</table>
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</table>

W2.1.2.	Develop new methodologies and design watershed protection zone projects at all water sources integrating climate change aspects
Measure Type	Policy, Capacity building and Institutional Strengthening
Description	Protection zones of water sources used for public water supply are defined and treated in accordance with the Rulebook on Determining and Maintenance of Zones and Belts of Sanitary Protection of Water Sources and Limitations in these Zones, endorsed in 2009. This legal act defines three protection zones – the first zone (belt surrounding the source at least 10 meters, where the only allowed activities are the ones directly related to water abstraction and purification. This zone has to be clearly demarcated by fences and signs), second zone (where construction and other activities that can impact water quality are prohibited. This zone should also be demarcated appropriately) and the third zone (catchment area - wider area defined by topography and other natural features in order to reduce the risk of contamination from non-degradable radioactive and chemical substances). All water sources for settlements larger than 200 inhabitants should have all three zones, for settlements between 20 and 200 inhabitants the third zone does not need to be defined, and for sources supplying less than 20 inhabitants, only the first zone needs to be defined. In practice, out of 89 public water supply companies, just over half have clearly defined sanitary zones, and these are the largest municipal companies. Water sources in rural areas do not have them. The common reason is the lack of financial and human capacities to prepare the elaborates the definition of these protection zones and based on that to construct appropriate protective measures and enforce them continuously.

	For defining the sanitary protection zones and proper management of the water sources, the continuous monitoring of water sources in the field is required but is also something that is lacking due to deficient capacities of managing companies. The companies do not have data on abstracted vs delivered quantities and losses along the network, nor continuous monitoring of water quality, water flows and climatic parameters that impact them, which is of particular relevance in the context of climate change. Another issue in this respect is that the Rulebook on Sanitary Zones does not explicitly mention climate change, nor the vegetation and other ecosystem-related aspects for defining the sanitary zones. The water sector's legislative and policy framework also does not envisage climate change adaptation nor nature-based solutions for the protection of water sources in the face of climate change. Furthermore, the Rulebook does not define the expertise that is required in order to define the sanitary zones, nor does it envisage the revision process. The way this measure should address these issues is twofold – strengthening the legislative and policy framework by mainstreaming climate change adaptation considerations, as well as raising the capacities of water companies to address and enforce these requirements. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. This will be achieved by the following activities: - Support the revision of the Rulebook on sanitary zones and elaborate on sanitary zones to mainstream climate change adaptation - In accordance with the new rules on sanitary zones designation, update the existing sanitary zones and establish new ones where they are missing - Enhance the human capacities of water companies to implement and enforce new methodologies through targeted training programs - Support water companies to implement and enforce new methodologies through employing various financing mechanisms - Ensure the enforcement of sanitary zones through integration of data into the spatial planning and cadastre databases - Ensure the compliance of water companies with the obligations on reporting on water quantities and quality This measure should be integrated with the measure on strengthening the network of measuring stations and monitoring of water quality.
Vulnerability / Risk Addressed	Dependence on groundwater for water supply High pressure on water resources from various forms of use, especially energy sector Inadequately managed land Deficient protection of water sources Deficient water management system Unsustainable use of water from the public supply network Lack of knowledge, skills and data of the decision makers and other relevant institutions and other stakeholders The need for high financial investments into the water infrastructure Weaknesses in the water supply system Dependence on vulnerable and deficient water supply systems
Strategic and Operational Objectives Supported	**WSO 2.** Improved capacities for preparation and response to extreme hydrological weather events to reduce injury, deaths and infrastructure damages. **WSO 2.1.** Build capacities for integration of climate risks into planning
Linkage to Existing Policies/Plans	Water strategy - Strategic objective: Ensuring the sufficient quantities of water of appropriate quality for public water supply and other needs with the respect to the environment Strategic objective: achieving and maintaining the good status and good ecological potential of surface and underground waters, for the protection of public health, aquatic biodiversity and meeting the needs of users National Sustainable Development Strategy – measures 3.2.4.3, 3.2.4.4, 3.2.4.6, 3.2.4.7, 3.2.4.8, 3.2.4.12 NAP Measure: WM1.1.1: Strengthen the network of measuring stations and improve the monitoring of water related data
Gender and Equity Considerations	Rulebook on sanitary zones and elaboration on sanitary zones has been updated, and the new additions only include the aspects related to development and audit of technical documentation. It is necessary to develop and implement training programs which are going to promote gender equality and ensure the inclusion of women in decision-making and implementation processes. Gender-disaggregated data will be included into spatial planning and cadastre databases to better understand and address the different needs and priorities of women and men in relation to water sanitation. Gender-responsive reporting will be implemented by water companies to capture the diverse impacts of water management on women and men in the community.

and Implications

Status of Preparation

Under implementation to be scaled up/expanded.

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Revision of the Rulebook and elaborated on sanitary zones	2 years	Water Administration Ministry of Agriculture, Forestry and Water Management Water supply companies
Update existing and establish new sanitary zones	4 years	Water supply companies Water Administration
Develop and implement targeted training programs for water companies	3 years	Water Administration Educational institutions Water supply companies
Ensure financing for water companies through international funds or blended finance	5 years	Ministry of Agriculture, Forestry and Water Management Water Administration Water supply companies
Integration of sanitary zones in cadastre	2 years	Water Administration Administration for State Property
Establish a monitoring and evaluation system for water companies	2 years	Water Administration Water supply companies Ministry of Agriculture, Forestry and Water Administration

Measures Owner(s)

Ministry of Ecology, Sustainable Development and Northern region Development
Ministry of Agriculture, Forestry and Water Management
Water Administration

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Revision of the Rulebook and elaborated on sanitary zones						
Update existing and establish new sanitary zones						
Develop and implement targeted training programs for water companies						
Ensure financing for water companies through international funds and blended finance						
Integration of sanitary zones in cadastre						
Establish a monitoring and evaluation system for water companies						

Stakeholders

Stakeholder group	Engagement
Water companies	Revision of the elaborates for sanitary protection zones

		Update the existing and establish new sanitary zones Participate in training programs Prepare proposals for funding of the sanitary zones measures
	Ministry of Agriculture, Forestry and Water Management	Revision of the Rulebook on sanitary protection zones
	Human Resources Management Authority	Participate in the development and implementation of the training program Integrate the training program in the national human resources capacity building system
	Cadastre and State Property Administration	Integrate sanitary zones into the cadastre

Indicative Costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
€744,000	€466,000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	Ministry of Agriculture, Forestry & Water Management Budget (IPA Funding)	40%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Concessional Loan	International Development Partner	60%	

Impact Measures (Quantitative and Qualitative Indicators)

- Rulebook on sanitary zones updated
- Number of updated elaborates on sanitary zones
- Number of water companies implementing the new sanitary zones rules
- Number of participants at training programs
- Established monitoring system for water quantities and qualities (quality parameters determined by the relevant national legislation)

Potential Project Risks and Mitigation Options

Area	Risks	Mitigation options
Social	Lack of interest of staff in participating in the capacity development program	Ensure the program is integrated in the capacity building system of the Human Resources Management Authority
Economic	Lack of funding for the implementation of new sanitary zones rules by water companies	Ensure resource mobilization from international funds
Other	Lack of accountability of water companies for enforcement of sanitary zones	Establish monitoring and evaluation and accountability system

Health: priority adaptation measures

H1.1.1.	Improve the preparedness of staff, facilities and systems in the health sector for climate hazards, through training, climate risk assessments and specific interventions
Measure Type	Institutional Strengthening and Technical Measures
Opis	Currently, the health system in Montenegro currently has resources that can be used to reduce the future negative impacts of climate change through a system of specialized institutions (hospital for pulmonary diseases, medical emergency centres and ERs, hospitals, counselling centres, etc.). However, a better understanding of the expected changes as well as preventive action is required in order to improve the system. Namely, the healthcare sector may face a series of problems that arise as a result of inadequate preparation for climate change and the dangers that come with it, which would contribute to the additional vulnerability of the system, employees and facilities. The existing staff should possess adequate knowledge to effectively manage climate-related risks and trained to recognize and address health issues caused by extreme weather events, both in the immediate response and in long-term recovery efforts. The facilities, which were not originally designed to adapt to climate change, lack the necessary infrastructural adaptation. Also, the absence of an effective early warning system, except for heat waves, will limit the preparation and response of the health system to potential threats. This problem is further aggravated by the lack of standardized response protocols, as well as the lack of intersectoral cooperation, which is necessary for the successful implementation of the climate change adaptation strategy. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. This will be achieved by the following activities: ● Conduct a climate risk assessment to identify the potential impacts of climate change on existing systems and infrastructure and identify the key risk areas (assessment of technical and human capacity of outpatient and inpatient care services); ● Create/update clear protocols, guidelines and emergency and post-disaster response plans that will be based on best practices; ● Develop an action plan/program to adapt existing systems and infrastructure (e.g. establishing adequate premises to support those who may be particularly vulnerable during extreme weather events, providing access to safe drinking water, food, electric power, communications system, medicine, sanitation and other important resources); ● Adopt the new or adapt the current building regulations (for the construction of new, or retrofitting of health care facilities) to ensure climate resilience and environmental sustainability; ● Develop a targeted program for building the capacity/training of healthcare employees on understanding climate hazards, emergency response protocols and post-disaster recovery operations; ● Implementation of targeted capacity building/training programs for healthcare workers (train healthcare workers on handling difficult conditions and hazardous situations, identification of protective measures); ● Identify and position key participants within the network of health institutions (IPH, primary health care system, hospital system, emergency admissions system, veterinary; surveillance system, Institute for Hydrometeorology and Seismology and emergency sector of the Ministry of Internal Affairs, etc.); ● Strengthening the capacity of the Institute for Public Health to conduct human biomonitoring for environmental factors associated with climate change; ● Define health indicators related to climate change for assessing the direct and indirect impacts of climate variability and change on public health; ● Collect epidemiological descriptive data on the population and analyse environmental factors associated with climate change in human samples.
Vulnerability / Risk Addressed *[select from key findings]*	Weaknesses in the water supply system Vulnerability of the agricultural sector to climate change Lack of relevant capacities of the health sector No formally established climate adaptation planning process for the sector Deficient social care services Lack of designated financial resources for adaptation to climate change
Strategic Objective Supported	**HSO 1.** Improved human and technical capacities of the health sector to provide timely planning and response to climate hazards, with a particular focus on marginalized groups. **HOO 1.1** Enhance preparedness of the sector to climate change through development of processes and systems

<table>
<tr><td>[select from SOs list]</td><td></td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>Programme for Climate Change Adaptation of the Healthcare System 2020-2022 (2020)
Operational Objective 1, 2, 3 & 6
National Strategy for Sustainable Development until 2030
Healthcare Development Strategy (2023-2027) with an Action plan for the period 2023-2024</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Gender considerations will be integrated into a climate risk assessment and also into protocols, guidelines and emergency and post-disaster response plans. Action plan for adaptation of existing systems and infrastructure will take into consideration specific needs of women, as well as of vulnerable groups (children, elderly people, people with disabilities, LGBTI people, Roma and Egyptian people, migrants and asylum seekers). Capacity/training of healthcare employees will contain aspects related to gender and inclusion of vulnerable groups. Epidemiological descriptive data on the population will be gender disaggregated.</td></tr>
<tr><td>Status of Preparation</td><td>Under implementation to be scaled up/expanded</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Conduct a climate risk assessment</td><td>2 years</td><td>Ministry of Health
Ministry of Ecology, Sustainable Development and Northern region Development
Institute of Public Health</td></tr>
<tr><td>Create/update clear protocols, guidelines and emergency and post-disaster response plans</td><td>1 year</td><td>Ministry of Health
Ministry of Ecology, Sustainable Development and Northern region Development
Ministry of Interior – Directorate for Protection and Rescue
Institute for Public Health</td></tr>
<tr><td>Develop an action plan/program to adapt existing systems and infrastructure</td><td>2 years</td><td>Ministry of Health
Institute for Public Health
Ministry of Ecology, Sustainable Development and Northern region Development
Ministry of Interior – Directorate for Protection and Rescue</td></tr>
<tr><td>Adopt the new or adapt the current building regulations</td><td>1 year</td><td>Ministry of Spatial Planning, Urbanism and State Property
Ministry of Health</td></tr>
<tr><td>Develop and implement training programs</td><td>2 years</td><td>Ministry of Ecology, Sustainable Development and Northern region Development
Ministry of Health
Institute for Public Health
Educational institutions
UN agencies</td></tr>
<tr><td>Identify and position key participants within the network of health institutions</td><td>1 year</td><td>Ministry of Health
Institute for Public Health</td></tr>
<tr><td>Strengthening the capacity of the Institute for Public Health</td><td>2 years</td><td>Ministry of Health
Institute for Public Health</td></tr>
<tr><td>Define health indicators related to climate change</td><td>1 year</td><td>Ministry of Health
Institute for Public Health
Statistical Administration - MONSTAT</td></tr>
<tr><td>Collect epidemiological descriptive data</td><td>Continuously</td><td>Ministry of Health
Institute for Public Health
Statistical Administration - MONSTAT</td></tr>
</table>
</td></tr>
<tr><td>Measures Owner(s)</td><td>Ministry of Ecology, Sustainable Development and Northern region Development
Ministry of Health
Institute for Public Health</td></tr>
</table>

	Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Timeframe	Conduct a climate risk assessment						
	Create/update clear protocols, guidelines and emergency and post-disaster response plans						
	Develop an action plan/program to adapt existing systems and infrastructure						
	Adopt the new or adapt the current building regulations						
	Develop and implement training programs Develop and implement training programs						
	Identify and position key participants within the network of health institutions						
	Strengthening the capacity of the Institute for Public Health						
	Define health indicators related to climate change						
	Collect epidemiological descriptive data						

Stakeholders

Stakeholder group	Engagement
Ministry of Tourism, Ecology, Sustainable Development and Northern Region Development	Provide data and inputs for the process
Ministry of Health	Provide data and inputs for the process Oversee the development and implementation of training programs
Institute of Public Health	Provide data and inputs for the process Oversee the development and implementation of training programs Collect epidemiological data
Ministry of Interior	Provide data and inputs for the process
Ministry of Spatial Planning, Urbanism and State Property	Provide data and inputs for the process re building regulations
Educational institutions	Implement capacity building programs
MONSTAT	Provide inputs for the health indicators Support during the collection of the data
UN Agencies	Provide technical and financial support
Institute for Hydrometeorology and Seismology	Provide data and input relevant for climate change, conduct analyses, studies and surveys in the field of climate and climate change, and within other competencies of the IHMS (water, air and water quality, hydrography, oceanography and seismology), participate in public consultations.

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
584,000	256,000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	National Government, Ministry of Health Budget (IPA funds)	40%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Concessional debt	International Development Partner	60%	

Impact Measures (Quantitative and Qualitative Indicators)

- % of healthcare facilities assessed;
- % of healthcare workers trained;
- No. training workshops delivered;
- Compliance rate of healthcare premises with building regulations regarding climate resilience;
- Intersectoral Collaboration Rating;

	• Capacity Strengthening Index; • No. of the IPH staff trained in biomonitoring; • No. of adequate premises for supporting vulnerable populations; • No. of health indicators defined; • Frequency of indicator measurement; • Impact of research on health policy; • No. of epidemiological studies conducted.		
Co-benefits	• Public health improvement; • Reducing healthcare sector vulnerability; • Lowering the costs associated with health care delivery during and after climate events; • Saving from prevented infrastructure damage.		
Potential Project Risks and Mitigation Options	**Oblast**	**Rizici**	**Opcije za ublažavanje**
	Social	Healthcare workers are reluctant to implement new protocols for emergency and post-disaster response plans Healthcare workers and/or stakeholders may be skeptical about the need for climate change adaptation measures or may lack awareness of the potential impacts of climate change on public health.	Introduce climate hazard preparedness as part of mandatory training for current healthcare workers. Embed climate risk and resilience topics into the curricula at medical faculties and high schools.
	Economic	Conducting comprehensive analyses, refining guidelines and action plans, capacity building and collecting data may require significant financial resources. Temporary productivity losses may occur due to the redirection of healthcare workers from their regular duties to participate in training or implement new protocols.	Ensure grants, sponsorships, or donations from governmental agencies, international and private organizations, or philanthropic institutions. Phased Implementation of new protocols and training.
	Other	Insufficient or unreliable data on past climate trends and future projections could undermine the accuracy and reliability of the risk assessment. Changes in regulations or compliance requirements may necessitate updates to guidelines or action plans, potentially leading to additional costs for legal consultation, documentation, or regulatory approvals.	Foster collaboration among different stakeholders, including government agencies, research institutions, and international organizations, to share data, expertise, and resources. Establish a process for regular monitoring and review of relevant regulations and compliance requirements.

H1.1.2.	Include and define health sector's role in hazard preparedness and response in the national and local level readiness plans
Measure Type	Policy measure
Description	Despite the fact that there are national and local preparedness plans in Montenegro that are key frameworks for responding to different types of hazards, plans in the health sector are not sufficiently developed or aligned with broader preparedness plans. The lack of integration of health services into comprehensive plans, especially with regard to managing health risks during hazardous events, poses a significant challenge. The lack of alignment between healthcare institutions, local authorities, emergency agencies, and other relevant stakeholders may lead to inefficient resource utilization, and duplicated efforts and may limit the ability to respond promptly to crises. The health sector must improve planning, with a clear focus on the continuity of provision of health services in periods of crisis, as well as on ensuring availability of health care in conditions of shocks and stress. This requires an integrated and comprehensive approach that includes improved preparedness, intersectoral coordination, resource mobilization and introduction of alternative supply channels. In this regard, the plan to analyse existing plans from the health sector's perspective and draw conclusions on how the sector can improve its inputs into the planning processes defined at the national and local levels. Additionally, the roles of institutions such as the Institute of Public Health, Health Care Centres and hygiene epidemiological services, need to be clearly defined and incorporated into these plans. This includes ensuring the uninterrupted operation of healthcare facilities, such as hospitals, clinics, and primary care centres, even in the face of disasters or emergencies. Measures should be in place to protect healthcare infrastructure, secure medical supplies, and ensure the safety of healthcare workers and patients. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure will consist of the following steps: ● Conduct a comprehensive assessment of the existing national and local level readiness plans to identify gaps and deficiencies in recognizing the role of the health sector; ● Engage and collaborate with stakeholders from the health sector, including representatives from the Ministry of Health, Institute of Public Health, hygiene epidemiological services, Health Care Centres, and other relevant institutions; ● Develop Standard operating procedures (SOPs) at the national and local level including health-related aspects of hazard preparedness and response, such as maintaining health services, managing disease outbreaks, conducting surveillance, providing medical care, and coordinating with other sectors; ● Clearly define the roles and responsibilities of the health sector in hazard preparedness and response within the readiness plans; ● Establish effective communication and coordination mechanisms between the health sector and other relevant agencies at national and local levels.
Vulnerability / Risk Addressed	Lack of relevant capacities of the health sector No formally established climate adaptation planning process for the sector
Strategic Objective Supported	**HSO 1.** Improved human and technical capacities of the health sector to provide timely planning and response to climate hazards, with a particular focus on marginalized groups. **HOO 1.1** Enhance preparedness of the sector to climate change through development of processes and systems
Linkage to Existing Policies/Plans	National Strategy for Sustainable Development until 2030 Programme for Climate Change Adaptation of the Healthcare System 2020-2022 (2020)
Gender and Equity Considerations and Implications	Within a comprehensive assessment of the existing national and local level readiness plans to identify gaps and deficiencies in recognizing the role of the health sector, gender-specific vulnerabilities and needs will be addressed. Provisions related to maternal health services, access to reproductive health care, and the risk of raising gender-based violence in emergency situations will be addressed in Standard operating procedures (SOPs) at the national and local levels.
Status of Preparation	Under implementation to be scaled up/expanded

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Conduct a comprehensive assessment of the existing national and local level readiness plans	1 year	Ministry of Health Institute of Public Health Health Care Centres
Engage and collaborate with stakeholders from the health sector	Continuously	Ministry of Health Institute of Public Health Health Care Centres
Develop SOPs at the national and local level	2 years	Ministry of Interior Ministry of Health Institute of Public Health Health Care Centres Municipalities
Clearly define the roles and responsibilities of the health sector	1 year	Ministry of Health Institute of Public Health Health Care Centres
Establish effective communication and coordination mechanisms	Continuously	Ministry of Interior Ministry of Health Institute of Public Health Health Care Centres

Measures Owner(s)

Ministry of Ecology, Sustainable Development and Northern Region Development
Ministry of Health
Institute for Public health

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Conduct a comprehensive assessment of the existing national and local level readiness plans						
Engage and collaborate with stakeholders from the health sector						
Develop SOPs at the national and local level						
Clearly define the roles and responsibilities of the health sector						
Establish effective communication and coordination mechanisms						

Stakeholders

N/A

Indicative costs	CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]

	590,000	540,000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	National Government, Ministry of Health Budget (IPA funds)	40%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Concessional debt	International Development Partner	60%	

Impact Measures (Quantitative and Qualitative Indicators)

- No. of SOPs developed at the national and local levels;
- Compliance rate with international standards and guidelines;
- Level of involvement of health sector stakeholders in SOP development;
- No. of communication channels established.

Co-Benefits

- Enhanced preparedness for future hazards;
- Intersectoral collaboration improved;
- Better resource allocation and utilization.

Potential Project Risks and Mitigation Options

Area	Risks	Mitigation options
Social	During the development and implementation of readiness plans and SOPs, there is a risk that specific marginalized or vulnerable groups within society may be disregarded or omitted.	Actively involve representatives of marginalized or vulnerable groups in the process of developing readiness plans and SOPs. Develop tailored communication strategies that are accessible and understandable to different communities.
Economic	Allocating resources to emergency preparedness and response activities could lead to funds being redirected from other critical sectors or projects, potentially resulting in trade-offs and compromises in delivering services, developing infrastructure, or supporting social programs.	Promote efficient resource utilization through the application of efficiency principles. Identify key sectors or projects vital to public health and safety. Use of alternative financial sources, such as public-private partnerships, grants, or international assistance

H1.1.3.	**Introduce an early warning system to prepare the health sector for appropriate response during the weather extremes, supported by training programs to enhance knowledge and skills of the workforce in the health care facilities**
Measure Type	Technical Measures
Description	An early warning system (EWS) is a vital tool for equipping the health sector to tackle extreme weather conditions and reducing their impacts. The system should furnish forecasts regarding the probability and severity of extreme weather events. By implementing an efficient early warning system, healthcare providers and stakeholders can receive advance alerts about impending extreme weather events, enabling them to undertake necessary preparations and interventions. Training programs will enhance the proficiency of healthcare professionals in utilizing the early warning system to prepare for extreme weather conditions, identifying and managing health issues arising during such events, and effectively communicating with patients amidst these circumstances. The aim of this measure is to improve inputs provided by the health sector for the development of these systems at the national and local levels. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure will consist of the following steps: ● Conduct an assessment of any existing early warning system and the current capacity of the health sector to respond effectively to extreme weather conditions; ● Define the scope and objectives of the EWS and engage stakeholders to understand its application and integration throughout the sector and with other sectoral and national EWS, including creating the National Action Plan for Heat Waves and Cold Spells as a joint platform for cooperation among state institutions; ● Develop and implement an EWS for the health sector, ensuring real-time information about heat waves is readily available (heat waves, cold waves, air pollution, water pollution, floods, etc.); ● Develop and implement training programs for health workers at all levels of health care and establish a crisis management plan; ● Carry out monitoring and evaluation of the early warning system and implemented training programs.
Vulnerability / Risk Addressed	Vulnerability of the agricultural sector to climate change Lack of relevant capacities of the health sector No formally established climate adaptation planning process for the sector Deficient social care services Lack of designated financial resources for adaptation to climate change People living in remote villages still have limited access to health care. Rural women and women from vulnerable and marginalized groups face additional difficulties in reaching the health and social services due to lack of information, limited mobility and lack of time, as they are constantly busy taking care of the family and household There is no reliable data on the impact of climate change on human health, as this data has not been integrated with compulsory health records.
Strategic Objective Supported	**HSO 1.** Improved human and technical capacities of the health sector to provide timely planning and response to climate hazards, with a particular focus on marginalized groups. **TSO 3.** Establishing/strengthening multi-sector coordinated approaches and mechanisms to strengthen preparedness for early warning and planning for climate change. **HOO 1.1** Enhance preparedness of the sector to climate change through development of processes and systems
Linkage to Existing Policies/Plans	Programme for Climate Change Adaptation of the Healthcare System 2020-2022 (2020) Operational Objective 1, 2, 3 & 6 Linked to Tourism NAP Measure: 'T3.1.1 Implement and upgrade early warning systems for hazards for tourism users and business and awareness program to communities to inform them of procedures when early warning is given'

Gender and Equity Considerations and Implications	Assessment of the existing early warning system and the current capacity of the health sector to respond effectively to extreme weather conditions will take into consideration specific capacities and needs of vulnerable social groups (children, the elderly, people with chronic diseases, people with disabilities, LGBTI people, marginalized communities, outdoor workers). NGOs working on women empowerment and empowerment of vulnerable groups will be included in development of EWS and National Plans for Heat Waves and Cold Spells. Training programs for health workers at all levels of health care and establishment of a crisis management plan will take into account the gender aspect, including the fact that the majority of health workers are women.
Status of Preparation	Under implementation to be scaled up/expanded.

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Conduct an assessment of any existing early warning system and current capacity of the health sector to respond effectively to extreme weather conditions	1 year	Ministry of Health Institute of Public Health Ministry of Interior Institute for Hydrometeorology and Seismology
Define the scope and objectives of the EWS and engage stakeholders to understand its application and integration throughout the sector and with other sectoral and national EWS	1 years	Ministry of Health Institute of Public Health Health institutions
Develop and implement an early warning system for the health sector	3 years	Ministry of Health Institute of Public Health Ministry of Interior Institute for Hydrometeorology and Seismology
Develop and implement training programs for health workers at all levels of health care and establish a crisis management plan.	3 years	Ministry of Health Institute of Public Health Ministry of Interior Ministry of Education, Science and Innovation Educational institutions Health institutions
Carry out monitoring and evaluation of the early warning system and implemented training programs	3 years	Ministry of Health Institute of Public Health Health institutions

Measures Owner(s)	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Health and Institute for Public Health

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Conduct an assessment of current capacity						
Define the scope and objectives of the ESW						
Develop and implement EWS						
Develop and implement training programs and crisis management plan						
Monitoring and Evaluation						

Stakeholders

Stakeholder group	Engagement
Ministry of Health	Provide data and inputs for the process Oversee the development and implementation of training programs and early warning system
Institute of Public Health	Provide data and inputs for the process Oversee the development and implementation of training programs and early warning system
Ministry of Internal Affairs	Provide data and inputs for the process Oversee the development and implementation of early warning system
Educational institutions	Implement capacity building programs
Institute for Hydrometeorology and Seismology	Provide data and inputs for the early warning system
Health institutions	Implement capacity building programs

Indicative Costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
916,000	474,000	N/A

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	National Government, Ministry of Health Budget (IPA funds)	40%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Grant	International Development Partner	60%	

Impact Measures (Quantitative and Qualitative Indicators)

- % of health sector facilities evaluated for readiness;
- Identification of gaps in response capacity;
- % of alignment with sectoral and national EWS objectives;
- Timeliness of alerts and accuracy of forecasts;
- No. training workshops delivered;
- No. of health workers trained;
- % of health facilities with crisis management plans in place;
- No. of evaluations conducted.

Co-Benefits

- Public health improvement;
- Intersectoral collaboration increase;

	• Healthcare infrastructure strengthened; • Improved environmental protection.		
Potential Project Risks and Mitigation Options	**Oblast**	**Rizici**	**Opcije za ublažavanje**
	Social	Engaging stakeholders from diverse sectors and interests may lead to conflicts over the scope, objectives, and priorities of the EWS	Clearly define the roles and responsibilities. Ensure clear communication channels are established to keep stakeholders informed about the process, progress, and outcomes of the EWS development.
	Economic	The cost of purchasing and installing equipment, maintaining and upgrading infrastructure and ensuring connectivity and reliability can be significant	Conducting thorough cost-benefit analyses to justify expenditures and identify potential savings.

H3.1.1	**Development and promotion of education, awareness raising and general guidelines and support of facilities for the population during heat waves and extremes.**
Measure Type	Capacity development and Institutional strengthening
Opis	Increased knowledge of the general population about the health risks associated with heat waves and extreme weather conditions would contribute to reducing the population, especially vulnerable marginalized and isolated groups, vulnerability to climate change. In addition to reducing the risk of negative consequences for people's health and life, it would influence behaviour change and create a more resilient society. This measure would include educating and informing citizens about health impacts that may arise due to heat waves, cold spells, floods, water pollution, air pollution. Chronic and acute climate change impacts can lead to a variety of health problems, including heat stroke, allergies and respiratory illness, infectious diseases, dermal problems, dehydration, and mental health issues. Also, extreme weather conditions reduce work productivity, especially for those who work outdoors. Extreme weather conditions can cause contamination of drinking water sources, air pollution, destruction or serious damage to homes and property, healthcare institutions and hospitals, destroy crops and land, resulting in the spread of infectious diseases, problems with moisture, displacement of the population, difficult access to health care, food shortages, etc. Not all population groups are equally vulnerable to the consequences of these events, therefore special attention should be paid to the elderly population (over 65), children, chronically ill people, and pregnant women. Through this measure, the population will also be educated about ways to protect themselves from extreme climatic conditions, such as how to behave properly during a heat wave, or floods, recognize the symptoms of heatstroke, infectious diseases, what the best protection practices, and what types of support they can get and from whom. Climate change is set to increase the likelihood and magnitude of heat waves and extreme weather conditions which will cause these events to become more deadly, causing increasing inequality, especially for vulnerable populations. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure will consist of the following steps: • Conduct a detailed analysis of existing measures, practices and support for the population during heat waves and extreme weather conditions about competent institutions (Ministry of Health, Institute of Public Health, Ministry of Interior - Sector for Extreme Events, Ministry of Tourism, Ecology, Sustainable Development and Northern Region Development, Ministry of Labour and Social Welfare, Environmental Protection Agency) and other stakeholders (business, media, NGOs);

<table>
<tr><td></td><td>

Create/update clear guidelines, action plans that will be based on best practices on national and local levels for protecting vulnerable populations during extreme weather conditions, and which will serve as a common platform for the cooperation of institutions and authorities;
Determine the level of knowledge, attitudes and practice (KAP survey) of the population in the event of heat waves and extreme weather conditions as a basis for creating training programs and public campaigns;
Develop and implement training programs for different civil society groups and community groups to prepare and help the wider population respond to extreme weather conditions;
Develop and implement a public campaign (promotional materials, media campaigns, etc.) aimed at different groups (children, the elderly, pregnant women, the chronically ill, socially disadvantaged, and outdoor workers);
Evaluate implemented public campaigns and education programs.

</td></tr>
<tr><td>Strategic Objective Supported</td><td>Changes in temperatures (rising temperatures and heatwaves)
Reduction in precipitation and increased occurrence and duration of droughts
Deteriorating air quality
Increased inland and coastal flooding
Increased exposure to vector borne diseases and alien and invasive species that pose a health risk
Increased occurrence and duration of wild fires
Poor air quality
Weaknesses in the water supply system
Vulnerability of the agricultural sector to climate change
No formally established climate adaptation planning process for the sector
People living in remote villages still have limited access to health care. Rural women and women from vulnerable and marginalized groups face additional difficulties in reaching the health and social services due to lack of information, limited mobility and lack of time, as they are constantly busy taking care of the family and household</td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>HSO 3. Improved public awareness, particularly for vulnerable groups, to reduce the health-related impacts of climate change.
HOO 3.1 Implement public preparedness and awareness campaigns and measures</td></tr>
<tr><td>Status of Preparation</td><td>Programme for Climate Change Adaptation of the Healthcare System 2020-2022 (2020)
Operational Objective 1, 3 & 5</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Under implementation to be scaled up/expanded</td></tr>
<tr><td>Strategic Objective Supported</td><td>A gender sensitive Knowledge, Attitudes, and Practices (KAP Survey) will be integrated in the detailed analysis of existing measures, practices and support for the population during heat waves and extreme weather conditions. Results of the KAP Survey will help better understand how men, women and vulnerable groups perceive and respond to heat waves and extreme weather conditions. This data can help in designing guidelines, action plans, training programs and public campaigns that address gender-specific knowledge gaps and attitudes.</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Detailed analysis of existing measures, practices and support for the population</td><td>1 year</td><td>Ministry of Health
Institute of Public Health
Ministry of Interior
Ministry of Ecology, Sustainable Development and Northern Region Development
Environmental Protection Agency
Ministry of Labour and Social Welfare</td></tr>
</table>
</td></tr>
</table>

	Create/update clear guidelines, action plans	2 years	Ministry of Health Institute of Public Health Ministry of Interior
	Determine the level of knowledge, attitudes and practice of the population (KAP survey)	1 year	Ministry of Health Institute of Public Health Ministry of Interior Research companies
	Develop and implement training programs for civil society and community groups	3 years	Ministry of Health Institute of Public Health Ministry of Interor Ministry of Education, Science and Innovation Educational institutions
	Develop and implement a public campaign aimed at different groups of population	3 years	Ministry of Health Institute of Public Health
	Evaluate implemented public campaigns and education programs	2 years	Ministry of Health Institute of Public Health

Measures Owner(s)	Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Health and Institute for Public Health

Timeframe

Aktivnost	**Godina 1**	**God. 2**	**God. 3**	**God. 4**	**God. 5**	**Godine 6-10**
Detailed analysis of existing measures, practices and support for the population						
Create/update clear guidelines, action plans						
Determine the level of knowledge, attitudes and practice of the population (KAP survey)						
Develop and implement training programs for civil society and community group						
Develop and implement a public campaign aimed at different groups						
Evaluate implemented public campaigns and education programs						

Stakeholders

Stakeholder groups	Engagement
Ministry of Health	Provide data and inputs for the process Oversee the development and implementation of training programs Participate in the public campaign
Institute of Public Health	Provide data and inputs for the process Oversee the development and implementation of training programs Participate in the public campaign
Ministry of Internal Affairs	Provide data and inputs for the process Oversee the development and implementation of training programs Participate in the public campaign
Ministry of Tourism, Ecology, Sustainable Development and Northern Region Development	Provide data and inputs for the process
Ministry of Labour and Social Welfare	Provide data and inputs for the process
Environmental Protection Agency	Provide data and inputs for the process
Ministry of Education, Science and Innovation	Oversee the development and implementation of training programs
Educational institutions	Implement capacity building programs
Research companies	Conduct KAP surveys
Institute for Hydrometeorology and Seismology	Provide data and input relevant for rural tourism and agriculture, conduct analyses, studies and surveys in the field of climate and climate change, and within other competencies of the IHMS (water, air and water quality, hydrography, oceanography and seismology), participate in public consultations.

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
536,000	384,000	N/A

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Napomena:
Own Source	National Government, Ministry of Health Budget (IPA funds)	40%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Grant	International Development Partner	60%	

Impact Measures (Quantitative and Qualitative Indicators)

- Number of measures/practices identified and assessed.
- Identification of gaps in support for the population during extreme weather conditions
- Changes in knowledge, attitudes, and practices compared to baseline (pre-campaign) data
- Number of training programs developed and implemented
- Participation rates
- Reach metrics (e.g., number of individuals reached, frequency of exposure to campaign materials)

<table>
<tr><td></td><td colspan="3">• Lessons learned for program refinement</td></tr>
<tr><td>Co-benefits</td><td colspan="3">• Public health improvement
• Increased Community Resilience
• Environmental protection improvement
• Reducing disparities in access to information, resources and support, promoting social equality and inclusivity
• Improved governance and policy development</td></tr>
<tr><td rowspan="3">Potential Project Risks and Mitigation Options</td><td>Oblast</td><td>Rizici</td><td>Opcije za ublažavanje</td></tr>
<tr><td>Social</td><td>Some groups within the population, especially those residing in rural or marginalized areas, may face restricted access to information, resources, and support services concerning preparedness and response to extreme weather events, resulting in inequalities in resilience and outcomes.

Public campaigns and education programs aimed at specific groups (e.g., outdoor workers, pregnant women) may inadvertently lead to stigmatization or discrimination

Public awareness campaigns and training programs may inadvertently increase anxiety or fear among the population about the risks of extreme weather events</td><td>Using technological platforms such as mobile applications and SMS alerts to provide timely weather updates, emergency notifications, and preparedness information to remote regions. Additionally, setting up community-based resource centres or information hubs where residents can obtain educational materials, emergency kits, and participate in training sessions on preparedness measures.

Implementing focused messaging campaigns that highlight inclusivity, respect, and support for every member of the community, irrespective of their occupation, health status, or demographic attributes.

Integrating elements of psychological resilience into public awareness campaigns and training programs, including techniques for managing stress, developing coping strategies, and fostering community support networks.</td></tr>
<tr><td>Economic</td><td>Performing thorough analyses, developing and revising guidelines and action plans, and organizing training sessions and public outreach efforts may necessitate substantial financial investments in research, material production, event coordination, and promotional activities, leading to elevated operational expenses.</td><td>Seeking grants, sponsorships, or donations from government bodies, international and private organizations, or philanthropic entities. Utilizing volunteers or interns to assist with tasks such as data collection, administrative work, or event coordination</td></tr>
</table>

Tourism: priority adaptation measures

T1.1.1.	**Developing community-based tourism programs as a strategy for building climate resilience e.g. promoting rural, agro and eco-tourism and other high value, low impact tourism products.**
Measure Type	Capacity development and Institutional strengthening
Opis	Existing risk assessments and available scientific research, as stated in the "Tourism Development Strategy of Montenegro 2022-2025," lead to the conclusion that Montenegrin tourism is at risk of multiple climate hazards, particularly changes in precipitation patterns (floods and droughts), higher temperatures and coastal erosion, changes in the marine environment, storm winds and storms. It is critical that these communities receive assistance in developing adequate infrastructure and capacity to handle increased visitor numbers as a result of potential changes in climate parameters and resource base (e.g., beach loss, increased water scarcity). To strengthen the tourism sector's climate resilience, it is necessary to work on product diversification and the development of tourism branches with high value and low impact on climate change. These branches include rural tourism, ecotourism, cycling tourism, and health tourism (medical and non-medical, where non-medical could also be included through the previously mentioned forms of rural tourism, ecotourism, agrotourism, cycling tourism, and so on). The aim of this measure is to reduce tourism's vulnerability to climate change, which will ensure the development of sustainable tourism and its positive impact on the economy, the environment, and the preservation of natural and cultural resources of the community. In addition to state-level strategic documents, it is also necessary to define the obligation to adopt programs at the local level, that is, individual adopt programs related to strengthening tourism's climate resistance to climate change. Given the current level of knowledge and awareness about the impact of climate change, it is necessary to first organize trainings (educational programs) to learn about the impact, consequences, and potential solutions. Adopting a Manual that describes the impact of climate change on tourism and how to overcome these issues would significantly aid in the implementation activities. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured.
Vulnerability / Risk Addressed	Sector extremely sensitive to crisis situations Adaptive flexibility of certain subsectors Pronounced gender disparities Deficient institutional capacities Lack of specific climate adaptation policy guidance and active/ effective sustainability framework High dependence/occurrence of informal/unregistered employment (cash in hand) Tourism sector not properly integrated with others in respect to climate change
Strategic and Operational Objectives Supported	**TSO 2.** Improve the understanding of tourism vulnerabilities to the impacts of climate change through monitoring, research and integration with data providers to build resilience and adaptive capacity of the industry. **TSO 3:** Establishing/strengthening multi-sector coordinated approaches and mechanisms to strengthen preparedness for early warning and planning for climate change.
Linkage to Existing Policies/Plans	Tourism Development Strategy of Montenegro 2022-2025 (Chapter: 11.4.2. Climate change; 14.4 Rural tourism and 109 Eco tourism) Health Tourism Development Program 2021-2023 Strategy for the development of cycling in Kolasin 2022-2025 Program for the development of rural tourism in Montenegro until 2025, including an action plan - draft Smart Specialization Strategy 2019-2024
Gender and Equity Considerations	Development of tourism branches with high value and low impact on climate change (rural tourism, ecotourism, cycling tourism, and health tourism) will include gender responsive measures, taking into account the significant participation of women both among providers of tourist services and among users. Programs at the local level will be gender responsive to maximize the opportunities for local women and to fully utilize these programs for starting and developing sustainable tourism businesses.

and Implications	
Status of Preparation	Under implementation to be scaled up/expanded

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Preparation and adoption of the Tourism Development Strategy with elements focused on building climate change resilience.	1 - 2 years	Government of Montenegro Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urbanism and State Property Ministry of Agriculture, Forestry and Water Management Ministry of Finance Ministry of Education, Science and Innovation National Council for Sustainable Development
Develop and disseminate the manual/ guidelines and standards	2 years	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urbanism and State Property Local self-governments Tourism associations (national and local level) Business community
Develop targeted capacity building programs	1 year	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Educational institutions
Implement targeted capacity building programs	4 years	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Educational institutions Tourism associations (national and local level)
Develop and implement public promotion	Continuously	Ministries Business community Tourism associations (national and local level) NGOs
Support projects	Continuously	Government of MNE Ministry of Education, Science and Innovation Innovation Fund EU funds and other international funds

Measures Owner(s)	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Spatial Planning, Urbanism and State Property

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Preparation and adoption of the Tourism Development Strategy with elements focused on building climate change resilience.						

	Develop and disseminate the manual/ guidelines and standards						
	Develop targeted capacity building programs						
	Implement targeted capacity building programs						
	Develop and implement public promotion						
	Support projects						

Stakeholders

Stakeholder group	Engagemen
Ministry of Tourism	Oversees the development, implementation and promotion of the Strategy and manual/guidelines and standards.
Ministry of Spatial Planning, Urbanism and State Property	Provides data and inputs for the process of overseeing the development and implementation of Strategy and manual/guidelines and standards
Ministry of Agriculture, Forestry and Water Management	Provides data and inputs for the process of overseeing the development and implementation of Strategy and manual/guidelines and standards
Ministry of Finance	The Ministry of Finance is in charge of the state's general economic policy and monitoring its implementation, including budget preparation, planning, and execution, as well as oversight of its use and other fiscal issues, and is thus largely responsible for financing activities aimed at achieving the stated measure, i.e. planned activities.
National Council for Sustainable Development and Climate Change	It is the Government's advisory body, and its work involves the consideration of strategic issues and the development of guidelines for specific areas of sustainable development. The council is also responsible for coordinating efforts among various departments and actors in order to achieve a broad social consensus on issues of sustainable development.
Local self-governments	Local self-government units coordinate and implement programs and projects that promote economic development, environmental protection, sustainable development, entrepreneurial initiatives, private-public partnerships, and regulatory changes in order to foster the development of local self-government.
Tourism associations (national and local level)	Provide data and inputs Promotion
NGO	There are a large number of non-governmental organizations in Montenegro that implement various projects and programs in order to contribute to the resolution of important issues such as the impact of climate change on the economy, society, and the environment.
Business community	The inclusion of large business associations, i.e., companies, results in better promotion, but also in obtaining opinions on the set goals, measures, and activities, because, in the end, the majority of businessmen are the ones who should "present" the given measure or activity.
Ministry of Education, Science and Innovation	The Smart Specialization Strategy defines two strategic areas: "Sustainable and health tourism" and "Agriculture." Through AP and the new Strategy that will be developed, it is necessary to include MSTD, because it is possible to devise activities that lead to the realization of various smart projects in the field of tourism with a reduced impact of climate change through their support programs, as well as the Innovation Fund.
Institute for Hydrometeorology and Seismology	Provide data and input relevant for rural tourism and agriculture, conduct analyses, studies and surveys in the field of climate and climate change, and within other competencies of the IHMS (water, air and water quality, hydrography, oceanography and seismology), participate in public consultations.

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
620.000	680.000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	National Government (EIP Chapter 27 Action Plan)	40%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change
Grant	International Development Partner	40%	
Equity	Private Sector	20%	

				Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.

Impact Measures (Quantitative and Qualitative Indicators)	● Guidelines on the impact of climate change on tourism and how to reduce it through the development of other types of tourism; ● Number of held educational programs; ● Number of attendees; ● Adopted a strategic document at the state level; ● Number of adopted local strategic documents.		
Co-Benefits	● Diversified tourist offers; ● Connection of economic branches; ● Development of municipalities, especially in the northern region of Montenegro; ● Reduced negative impact on the environment.		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation options**
	Social	Lack of interest among businesspeople and the general public in learning about the negative effects of climate change on tourism. Lack of motivation to develop alternative forms of tourism that help to mitigate the effects of climate change	Organization of trainings, seminars, and manual preparation; promotion of benefits, state subsidies, and support programs/projects (grant schemes)
	Economic	Increased water and air pollution Changes in the structure of biodiversity if we rely on traditional forms of tourism	

T1.2.2.	**Providing financial and non-financial support to tourism-based communities who are vulnerable to climate change to help diversify and adapt to climate change, with sustainable tourism offer.**
Measure Type	Capacity development and Institutional strengthening
Description	Climate change represents a significant challenge for the tourism economy in Montenegro, especially for tourism-based communities in coastal and mountainous areas that are very sensitive to their impacts. Adequate financial and non-financial support for adaptation to climate change would increase economic opportunities, reduce vulnerability and promote sustainable development practices. The goal is to help communities diversify their tourism offer and adapt to climate change in such a way that they are able to create an offer that is resilient to climate change. Raising awareness and knowledge about the importance of developing sustainable tourism and promoting the introduction of new resilient-strengthening practices is essential. Leading to reduced economic losses, preserving and enhancing the tourism industry and creating a sustainable tourist offer that will be attractive to tourists throughout the year. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure will consist of the following steps:

	• Conduct further analysis to identify tourism-based communities that are particularly vulnerable to climate change. With a particular focus on communities in coastal (changes in sea level) and mountain areas (changes in snowfall), as well as rural areas whose supply is seasonal and dependent on the availability of natural resources; • Assess the risk and impact of climate change on the communities' economy, tourism resources and infrastructure; • Develop a tourist offer that will be based on activities that are less sensitive to climate change such as adventure, health, cultural and ecotourism (to be connected with agriculture); • Establish funding programs i.e. unique lines of support from state institutions at the national and local level, and credit lines from commercial banks for communities that implement measures to adapt the tourism offer to climate change (diversification of the offer, adaptation of infrastructure, application of sustainable practices, promotion, etc.). Additionally, improve cooperation with international organizations and donors that provide financial and technical support for the adaptation of the tourism industry to climate change; • Promote financing programs that are intended for vulnerable communities and the development of sustainable tourism; • Develop and implement capacity building programs for different stakeholders in the tourist offer (institutions at the national and local level, representatives of the tourism industry, tourist operators, and the population), with the aim of understanding the impact of climate change on tourism and suitable preparation for adaptation to climate change; • Develop and implement the promotion of sustainable tourism at all levels (international, national and local (promotional materials, media campaigns, etc.)
Vulnerability / Risk Addressed	Changes in temperatures – rising temperatures on the land, increased occurrence and duration of heatwaves; Changes in temperatures - Increased temperature of water; Changes in temperatures – shortened duration of the snow season; Reduction in precipitation; High reliance of tourism products on weather and climate; High dependence of the sector on coastal tourism; High seasonality of tourism offers; Dependence on vulnerable and deficient water supply systems; Sector extremely sensitive to crisis situations; Deficient institutional capacities; A lack of product diversification in the light of climate change; Increasing efforts towards sustainability in the sector; Poor infrastructure for tourism.
Strategic and Operational Objectives Supported	**TSO 1.** Training and capacity building for all relevant stakeholders in the tourism sector to improve know-how and skills for the transformation of the tourism sector in the face of climate change and for obtaining support on implementing the adaptation activities. **TOO 1.2** Identify and develop funding opportunities to enhance transformation of the sector
Linkage to Existing Policies/Plans	Tourism Development Strategy of Montenegro 2022-2025 Health Tourism Development Program 2021-2023 Strategy for the development of cycling in Kolasin 2022-2025 Program for the development of rural tourism in Montenegro until 2025, including an action plan - draft Smart Specialization Strategy 2019-2024
Gender and Equity Considerations and Implications	Funds and financial programs for the development of innovative and sustainable practices in tourism will contain special measures to address barriers for women to access the financial opportunities. The promotion of sustainable tourism practices will be gender-sensitive and designed to promote women leadership and entrepreneurship in the tourism industry.
Status of Preparation	Under implementation to be scaled up/expanded.

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Identification of the tourism-based communities	6 months	Ministry of Tourism Ministry of Ecology, Sustainable development and Northern Region Development
Perform the analysis of the risk and impact of climate change on the tourism-based communities	1 year	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Research and scientific institutions
Develop a sustainable tourist offer	Continuously	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Agriculture, Forestry and Water Management Ministry of Health Business community Tourism associations
Establish and promote funding/financing programs	Continuously	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Ministry of Finance Investment and Development Fund Commercial banks Municipalities Donors National Tourism Organization Tourist Organizations on local level Tourism associations
Develop and implement capacity building programs for different stakeholder groups	4 years	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development National Tourism Organization Tourist Organizations on local level Tourism associations
Promotion of sustainable tourism offer	Continuously	Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development Local tourist organizations Tourism associations

Measures Owner(s)

Ministry of Tourism
Ministry of Ecology, Sustainable Development and Northern Region Development

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Identification of the tourism-based communities						
Perform the analysis of the risk and impact of climate change on the tourism-based communities						
Develop a sustainable tourist offer						
Establish and promote funding/financing programs						
Develop and implement capacity building programs for different stakeholder groups						
Promotion of sustainable tourism						

Stakeholders

Stakeholder group	Engagement
Ministry of Tourism Ministry of Ecology, Sustainable Development and Northern Region Development	Oversee the analysis, development, implementation and promotion of sustainable tourism Provide data and inputs for the process
Ministry of Agriculture, Forestry and Water Management	Provide data and inputs for the process Provide support for agriculture and tourism sustainable development
Ministry of Health	Provide data and inputs for the process Provide support for health tourism sustainable development
Ministry of Finance	Provide financial support
Investment and Development Fund	Provide financial and technical support
Commercial banks	Provide financial and technical support
Donors	Provide financial and technical support
National Tourism Organization	Promote of sustainable tourism offers
Tourist Organizations on local level	Promote of sustainable tourism offers
Local self-governments	Provide financial support Promotion of sustainable tourism Provide data and inputs
Educational institutions	Develop capacity building programs
Research and scientific institutions	Perform analysis Provide data and inputs
Business community	Provide data and inputs Promote of sustainable tourism offers
Tourism associations	Provide data and inputs Promote of sustainable tourism offers

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
760.000	630.000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	
Own Source	National Government	20%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Concessional loan	Investment and Development Fund	20%	
Grant	International Development Partner	40%	

Impact Measures (Quantitative and Qualitative Indicators)	• Number of sustainable tourist offers • Number of users of the support financial/technical program • Amount of financial support • Income from sustainable tourism services • Number of employees • Number of diversified tourist attractions • Number of capacity building workshops delivered • Number of stakeholders engaged		
Co-Benefits	• Diversified tourist offers • Development of municipalities, especially in the northern and rural region • Reducing climate vulnerabilities and strengthening the resilience of communities • Biodiversity and environmental protection		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation Options**
	Social	Lack of interest in the tourism sector to implement sustainable tourism offers	Design and implement awareness raising programs
	Environmental	Increased tourism may have environmental impacts	Ensure tourism offer is sustainable and is environmentally sensitive
	Economic	Lack of funds, insufficient and inadequate financial support Decrease of income in the transition period	Develop public-private partnerships Develop capacities for using international sources of financing projects in the field of sustainable tourism development Improving the quality of services and experience Market segmentation Design and implement awareness raising programs

T1.2.3.	**Improve funding opportunities to facilitate research and innovation into sustainable tourism practices and how they could be implemented more widely**
Measure Type	Capacity development and Institutional strengthening
Description	This measure aims to provide appropriate support to the scientific community, researchers, innovators, non-governmental organizations, and entrepreneurs to develop new technologies and practices in the tourism sector. In this way, the diversification of the tourist offers, the creation of new jobs and the reduction of social inequality will lead to a sustainable and resilient tourism sector. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. The measure will consist of the following steps: • Conduct further analysis of the problems and challenges related to climate change and tourism in Montenegro. • Analysis of existing financial sources of support for the implementation of research and innovation on sustainable practices in tourism.

<table>
<tr><td></td><td>

Establishment of funds and programs for financing the development of innovative and sustainable practices in tourism.
Financial and mentoring support for the implementation of sustainable initiatives and examples of good practices in the tourism sector (pilot projects).
Promote financing programs that are intended for the development of innovative and sustainable activities in tourism.
Develop and implement the promotion of sustainable tourism practices for different stakeholders (tourism industry, tourists, investors, public etc.)

</td></tr>
<tr><td>Vulnerability / Risk Addressed</td><td>Deficient planning processes
Deficient institutional capacities
Deficient meteorological and hydrological data communication
Tourism sector not properly integrated with others in respect to climate change
A lack of liaison/ coordination with the scientific and research (including meteorology) community
The lack of success in lengthening the unsustainably high levels of seasonality
Increasing efforts towards sustainability in the sector</td></tr>
<tr><td>Strategic and Operational Objectives Supported</td><td>Tourism Strategic Objective
TSO1.Training and capacity building for all relevant stakeholders in the tourism sector to improve know-how and skills for the transformation of the tourism sector in the face of climate change and for obtaining support on implementing the adaptation activities.
Tourism Operational Objective
TOO1.2. Identify and develop funding opportunities to enhance transformation of the sector</td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>Tourism Development Strategy of Montenegro 2022-2025
Smart Specialization Strategy 2019-2024
Program for the development of rural tourism in Montenegro until 2025, including an action plan - draft</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Gender impact assessment will be integrated into analyses on climate change and tourism to evaluate how sustainable tourism practices and financial opportunities impact women and men and to develop strategies to mitigate any disparities. Women running the rural tourism facilities and women working in the tourism industry will be consulted in the process. Mentoring programs will be tailored to address gender stereotypes and structural barriers for women in tourism business.</td></tr>
<tr><td>Status of Preparation</td><td>Under implementation to be scaled up/expanded</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Analysis of the key problems and challenges related to climate change and tourism</td><td>3 months</td><td>Ministry of Tourism</td></tr>
<tr><td>Analysis of existing financial sources of support</td><td>3 months</td><td>Ministry of Tourism
Ministry of Finance
Innovation Fund</td></tr>
<tr><td>Establish funds and programs for financing the development of innovative and sustainable practices in tourism</td><td>Continuously</td><td>Ministry of Tourism
Ministry of Finance
Innovation Fund
Investment and Development Fund
Commercial banks
Municipalities
Donors</td></tr>
<tr><td>Financial and mentoring support for the implementation of sustainable initiatives and examples of good</td><td>Continuously</td><td>Ministry of Tourism
Ministry of Finance
Innovation Fund</td></tr>
</table>
</td></tr>
</table>

	practices in the tourism sector (pilot projects)		Investment and Development Fund Commercial banks Municipalities Donors Research institutions
	Promotion of financing programs	Continuously	Ministry of Tourism Innovation Fund Research and scientific institutions
	Promotion of sustainable tourism practices	Continuously	Ministry of Tourism, Ecology Municipalities National Tourism Organization Tourist Organizations on local level Tourism associations

Measure Owner(s)	Ministry of Tourism

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Analysis of the key problems and challenges related to climate change and tourism						
Analysis of existing financial sources of support						
Establish funds and programs for financing the development of innovative and sustainable practices in tourism						
Financial and mentoring support for the implementation of sustainable initiatives and examples of good practices in the tourism sector (pilot projects)						
Promotion of financing programs						
Promotion of sustainable tourism practices						

Stakeholders

Stakeholder group	Engagement
Ministry of Tourism	Oversee the analysis, development, implementation and promotion research and innovation of sustainable tourism practices Provide data and inputs for the process
Innovation Fund	Provide support for research, innovation and sustainable tourism practices Provide data and inputs for the process
Ministry of Finance	Provide financial support
Investment and Development Fund	Provide financial and technical support
Commercial banks	Provide financial and technical support
Donors	Provide financial and technical support
Local self-governments	Provide financial support Promotion of sustainable tourism Provide data and inputs
National Tourism Organization	Promote of sustainable tourism offers
Tourist Organizations on local level	Promote of sustainable tourism offers
Research and scientific institutions	Perform analysis Provide data and inputs
Tourism associations	Provide data and inputs Promote of sustainable tourism practices

Indicative Costs

Kapitalni troškovi[€]	Operativni troškovi u toku 5 godina[€]	Troškovi razvoja / savjetovanja[€]
760.000	630.000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	National Government	20%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Concessional loan	Investment and Development Fund	60%	
Equity	Private Sector	20%	

Impact Measures (Quantitative and Qualitative Indicators)

- Number of research projects, pilot programs, start-ups;
- Number of new technologies, innovations or products;
- Amount of approved funds;
- Return of investment.

Co-benefits	- Development of science, research and innovation; - Development of sustainable tourism; - Reducing the tourism industry's dependence on seasonality; - Economic development; - Biodiversity and environmental protection.		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation options**
	Social	Lack of interest in the tourism sector to implement innovative and sustainable tourism practices Unequal access to financing can deepen inequality	Design and implement awareness raising programs Design and development of inclusive financing programs
	Economic	Low level of return on investment Increasing the cost of tourist services	Diversification of the projects Develop and implement professional support and mentoring Diversification of the tourist offer Market segmentation

T3.1.1.	**Upgrade early warning systems for tourism businesses and users and implement awareness program**
Measure Type	Capacity development and Institutional Strengthening
Opis	An early warning system (EWS) is crucial for the tourism sector in Montenegro because it can help minimize the impact of a range of hazards on visitors and the local economy. Montenegro's economy relies heavily on tourism, and hazard events can disrupt the industry by damaging infrastructure, causing transportation disruptions, and endangering the safety of visitors. With an effective early warning system in place, tourists and tourism operators can receive advance notice of impending hazard and slow-onset events, allowing them to take necessary precautions to protect themselves and their businesses. In addition to the early warning system a crisis management plan and awareness program needs to be implemented to ensure that when hazard and slow-onset events are detected that suitable plans and procedures can reduce and mitigate the potential impacts. These could take the form of guidance materials/ brochures / plans and trainings. Businesses and the general public are becoming more aware of the effects of climate change on tourism. It is necessary to ensure an accessible and effective way of distributing information, utilizing digital approaches. It could also be planned through the AP Strategies of Smart Specialization or supported through the Innovation Fund's programs. **Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured.** The measure will consist of the following steps: • Establish crisis management plan; • Develop education/training awareness programs; • Develop team and conducting research on current National and Sub-National EWS in Montenegro to understand how best a tourism EWS could be integrated;

<table>
<tr><td></td><td>

Define the scope and objectives of EWS and engage stakeholder to understand its application and integration;
Identify the key indicators and develop a data collection and analysis plan/process;
Establish a tourism early warning system including guidelines and processes;
Promotion of EWS and campaign.

</td></tr>
<tr><td>Vulnerability / Risk Addressed</td><td>Deficient planning processes
Deficient meteorological and hydrological data communication
Tourism sector not properly integrated with others in respect to climate change
A lack of liaison/ coordination with the scientific and research (including meteorology) community
Increasing efforts towards sustainability in the sector</td></tr>
<tr><td>Strategic and Operational Objectives Supported</td><td>TSO 3. Establishing/strengthening multi-sector coordinated approaches and mechanisms to strengthen preparedness for early warning and planning for climate change.
TOO 3.1 Improve coordination between climate services and tourism sector to strengthen preparedness</td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>Montenegro Tourism Development Strategy 2022-2025 (Chapters: 11.4.2. Climate change; 14.4 Rural tourism and 109 Eco tourism)
Disaster risk reduction strategy with a dynamic plan of activities for the implementation of the strategy for the period 2018 – 2023 (Pages: 2, 41 and 48)
Smart Specialization Strategy 2019-2024</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>Gender perspective and perspective of vulnerable groups will be integrated into the research on current National and Sub-National EWS in Montenegro. The team will be gender balanced. EWS and crisis management plans for tourism will be gender responsive. Education/training awareness program and campaign for EWS promotion will take into account specific information needs of vulnerable groups.</td></tr>
<tr><td>Status of Preparation</td><td>Project idea</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Develop team and conduct research on current National and Sub-National EWS in Montenegro to understand how best a tourism EWS could be integrated</td><td>6 months</td><td>Advisory role through participation in the implementation team and provision of available data and expertise:
Ministry of the Interior
Ministry of Tourism
Ministry of Education, Science and Innovation
Institute of Hydrometeorology and Seismology
Research and scientific institutions</td></tr>
<tr><td>Define the scope and objectives of EWS and engage stakeholder to understand its application and integration</td><td>6 months</td><td>Advisory role through participation in the implementation team and provision of available data and expertise:
Ministry of the Interior
Ministry of Tourism
Ministry of Education, Science and Innovation
Institute of Hydrometeorology and Seismology</td></tr>
<tr><td>Identify the key indicators and develop a data collection and analysis plan/process</td><td>3 months</td><td>Advisory role through participation in the implementation team and provision of available data and expertise:
Ministry of the Interior
Ministry of Tourism
Institute of Hydrometeorology and Seismology</td></tr>
<tr><td>Piloting of the EWS in tourism, including guidelines and processes.</td><td>9 months</td><td>Ministry of Tourism
Ministry of Education, Science and Innovation
Police Administration</td></tr>
</table>
</td></tr>
</table>

	Establish crisis management plan	6 months	Ministry of Tourism Police Administration
	Develop education/training awareness programs	6 months	Ministry of Tourism Ministry of Education, Science and Innovation Educational institutions
	Promotion of EWS and campaign	Continuous	Ministries Business community NGOs

Measures Owner(s)

Ministry of Tourism
Ministry of Interior

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5 & 6	Activity
Conducting research						
Scope and objectives of EWS						
Define key indicators						
Establish a tourism EWS						
Establish crisis management plan						
Develop education/training awareness programs						
Promotion of EWS and campaign						

Stakeholders

Stakeholder group	Engagement
Ministry of the Interior	Oversee the development, implementation and promotion of the EWS Provide data and inputs for the process
Ministry of Tourism	Oversee the development, implementation and promotion of the EWS Provide data and inputs for the process
Ministry of Education, Science and Innovation	Provide data and inputs for the process
Institute of Hydrometeorology and Seismology	Provide data and inputs for the process Implement EWS
Police Administration	Provide data and inputs for the process Implement EWS
Research and scientific institutions	Perform scientific studies Provide data and inputs for the process
Educational institutions	Develop education/training awareness programs

Indicative Costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
480.000	460.000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note
Own Source	National Government	60%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility),
Concessional loan	International Development Partners	40%	

				as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.

Impact measurement (Quantitative and Qualitative Indicators)	• Number of relevant indicators identified for the EWS; • Number of early warnings provided; • Number of education and awareness programs held; • Created an early warning system, as an application; • An adopted manual outlining the procedures to be followed in situations where early warnings are sent.		
Co-Benefits	• Tourist product diversification; • Engaging with a wide range of tourism stakeholders and benefits of connecting these groups; • Businesses educated on the issue of climate change adaptation; • Use of that EWS in other economic sectors (agriculture, forestry, water management, health).		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation options**
	Social	Lack of interest among businesses and the general public in learning about the negative effects of climate change on tourism.	Organization of trainings and seminars, adoption of strategic documents at the national and local self-government levels, prepared manual; promotion of the benefits of accepting the proposed early warning steps.
	Economic	Income loss in the tourism sector as a result of impacts of early warnings, however this will be offset by better preparation and proactive actions taken.	

Cross-cutting aspects: priority adaptation measures

CC1.1.1	**Create robust procedures for data collection, monitoring and reporting across sectors, with a data management database to ensure availability of data for planning, policy and programming**
Measure Type	Policy, Capacity development and Institutional strengthening
Description	Lack of consistent and accurate data is an inherent issue throughout all sectors of Montenegro. Across all NAP actions, transparent, robust and strong procedures are required for data collection, management and monitoring to enable successful adaptation to climate change. Good quality data management processes and systems will enable quick evidence-based decisions throughout implementation. The aim of the action is to ensure the availability of accurate and timely data for effective planning, policy formulation and programming for adaptation. Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured. Develop procedures: Working with stakeholders within each of the sectors, the current data environment will be assessed including an initial assessment of the data that is currently collected, stored and used. Likely data relevant to climate change will not be routinely collected for all sectors initially. Engaging with a wide range of stakeholders from government agencies, research institutions, NGOs and private sector actors will ensure that new procedures are inclusive and tailored to the needs of the sector. In establishing new processes, collection, management and analysis of disaggregated data will be sought, ensuring NAP actions are considering diverse groups and avoiding negative consequences to marginalized populations. Establish data management database: Firstly, goals and objectives for the database will be agreed to create a common understanding of the purpose and use of the database. The database will be designed in consultation with data management experts and a sample of users from the relevant sectors. The structure of the database will accommodate a range of data types, be scalable and efficient to use. It should also consider data security and privacy by integrating robust security measures to protect any sensitive data. It is critical that appropriate software is selected which is affordable and simple to maintain and use. Monitoring, reporting and verification (MRV): As part of the development of procedures, data collection processes will be cognizant of future monitoring and reporting. The monitoring procedures will be synchronized with the creation of the data management database. An ongoing MRV organizational structure will be developed, designating roles of responsibility to oversee monitoring. A supporting 'passport of indicators' will be created which details the units, rationale, methodology description, the baseline and any benchmarks of the indicator to guide ongoing monitoring. To support this action, capacity building and training will be integral to the new procedures. Capacity building will be provided on the monitoring and reporting processes. The launch of the data management database and new procedures will be preceded by pilot testing of the functionality of the platform and processes.
Vulnerability / Risk Addressed	• Agriculture: Lack of awareness and low adaptive capacity of farmers to respond to climate change • Health: Insufficient number of healthcare professionals and lack of capacity on climate related risks • Tourism: Lack of climate change data • Water: Lack of data and inter-sectoral cooperation.
Strategic Objective and Operational Goals Supported	**CCSO 1.** Support gender and vulnerable groups through collection and monitoring of disaggregated data. **CCOO 1.1** Collection of disaggregated data. **CCOO 2.1** Improve inter-sectoral collaboration to tackle climate change in a just and equitable way.

Linkage to Existing Policies/Plans	CBIT project (development of the MRV-E system for NAP and climate change in general) National Strategy for Sustainable Development Strategic goals 5.2, 5.4. Strategy for Agriculture and Rural Areas Operational objective E3 Strategy for Management of Water Resources 2017-2035, Goal 6.5. Mainstreaming of INSPIRE Directive into Montenegrin legal framework MRV/E
Gender and Equity Considerations and Implications	There is a lack of data that is disaggregated by sex, and also other intersectional aspects such as, age, disability and economic status. These are critical in order to effectively create, monitor and evaluate adaptation measures that seek to address the most vulnerable groups in Montenegro. This action will include capacity building on topics such as data types and uses, including how to use disaggregated data effectively. This will support all sectors to better consider diverse groups, in particular vulnerable and marginalized populations.
Status of Preparation	Project Idea

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Engage relevant stakeholders from sectors and agencies	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development MONSTAT WG NCSD CBIT project
Assess current data environment, and identify areas to improve data collection and MRV	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD, CBIT project
Define goals, objectives and scope of data management platform	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD, CBIT project
Detail, establish and agree new data processes and MRV organizational structure	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD, CBIT project
Identify key indicators and datasets, collect data and create Indicator Passport	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD, CBIT project
Develop database, and piloting	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD, CBIT project
Capacity Development Sessions	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD, CBIT project
Ongoing MRV	Continuous	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD, CBIT project

Timeline

Activity	Year 1	Year 2	Year 3	Year 4+
Engage stakeholders				
Assess data environment				
Define goals, objectives and scope				
Detail, establish and agree new data processes and MRV organizational structure				
Identify key indicators and datasets, collect data and create indicator passport				
Develop database and piloting				
Capacity development				
Ongoing MRV				

Measure Owner(s)

MONSTAT and CCAP coordinator

Stakeholders

Stakeholder group	Engagement (Inform, Consult, Involve, Collaborate, Empower)
MONSTAT	Oversee the process. Introduce new data collection systems and indicator-based monitoring. Participate in capacity building programs.
Data providers (MONSTAT, Institute for Hydrometeorology and Seismology, Agency for Environmental Protection, Water Administration, Forestry Administration, Public Health Institute, National Tourism Organization, Directorate for Payments of the Ministry of Agriculture)	Provide and grant assess to data. Comply with data sharing protocols. Generate new data in accordance with the protocols. Provide transparent reporting. Participate in capacity building programs.
Research institutions, civil sector	Participate in development of protocols, data assessment. Provide data and comply with data sharing protocols.

<table>
<tr><td>Indicative Costs</td><td>CapEx [€]</td><td>OpEx over 5 years [€]</td><td colspan="2">Development / Advisory Costs [€]</td></tr>
<tr><td></td><td>448.000</td><td>712.000</td><td colspan="2">-</td></tr>
<tr><td>Potential Financing Instruments and Sources</td><td colspan="4"><table>
<tr><th>Instrument (Own-Source, Grant, Debt, Equity, Other)</th><th>Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other</th><th>Amount € / Share %</th><th>Note:</th></tr>
<tr><td>Own sources</td><td>Government</td><td>20%</td><td rowspan="2">In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD.
The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.</td></tr>
<tr><td>Grant</td><td>International development partners</td><td>80%</td></tr>
</table></td></tr>
<tr><td>Impact Measures (Quantitative and Qualitative Indicators)</td><td colspan="2">% sex disaggregated datasets</td><td colspan="2">Baseline</td></tr>
<tr><td></td><td colspan="2">% datasets that include vulnerabilities to climate change</td><td colspan="2">Baseline</td></tr>
<tr><td></td><td colspan="2">% of indicators with complete data</td><td colspan="2">Baseline</td></tr>
<tr><td>Co-Benefits</td><td colspan="4">Improved environmental and hazard monitoring will contribute to Montenegro’s resilience by reducing exposure to environmental and climate hazards
Enhancing and supporting inter-sectoral cooperation
Database and processes can be used for other initiatives e.g. climate mitigation, environmental protection
Could support enforcement of environmental regulations
Could support development of new policy instruments</td></tr>
<tr><td>Potential Project Risks and Mitigation Options</td><td>Area</td><td>Risks</td><td colspan="2">Mitigation Options</td></tr>
<tr><td></td><td>Social</td><td>Data leak or security breaches</td><td colspan="2">Ensure data protection and privacy best practice is undertaken with the establishment of the database</td></tr>
<tr><td></td><td>Environmental</td><td>Data being used for detrimental activities</td><td colspan="2">Regularly review types of data and storage and prepare any necessary action plans to reduce opportunities for inappropriate uses of data</td></tr>
<tr><td></td><td>Economic</td><td>Additional cost of collecting disaggregated data</td><td colspan="2">Earmark the funds during the state budget planning. Prepare a portfolio of funding opportunities</td></tr>
<tr><td></td><td>Other</td><td>Reluctance of organizations and stakeholders to share data</td><td colspan="2">Build strong relationships within and between sectors and other stakeholders to ensure mutually agreed support and buy-in to the new data management processes

Prepare data sharing protocols and ensure compliance with them</td></tr>
</table>

<table>
<tr><th>CC2.1.1.</th><th>Inter-sectoral programming to integrate Agriculture, Tourism, Health and Water Sectors planning, with a shared flagship program tackling climate risks across the sectors.</th></tr>
<tr><td>Measure Type</td><td>Technical Measure and Institutional Strengthening</td></tr>
<tr><td>Opis</td><td>Climate change adaptation will require a robust, coordinated and holistic approach. For Montenegro, this will require different levels of government working collaboratively, with different departments coordinating efficiently. In Montenegro the connection and communication channels between government departments that are involved in addressing climate change have not been sufficiently developed to date, which limited the efficiency of response to climate challenges. The objective of this action is to establish inter-sectoral programming that integrates planning across Agriculture, Tourism, Health and Water sectors. The action aims to develop a shared flagship program to proactively address climate risks and enhance resilience across these interconnected sectors. The measure seeks to bring together stakeholders from the four focal sectors of the CCAP: Agriculture, Tourism, Health and Water, to build joint response to climate risks that affect all four sectors. Whilst the aim is to use this opportunity to mitigate climate risks through cooperation among sectors, a core element will be developing functional intersectoral connections and exchange of knowledge between ministries and stakeholders. These will all contribute to the adaptive capacity of, not only the sectors and ministries, but the whole country if the model can be replicated.

Taking into account the proposed CCAP implementation structure, appointment of focal points in key institutions is planned in the initial period of its implementation (immediately after adoption). One of their key roles will be to support the line ministry in coordinating and forming a team for the implementation of measures as a technical working group within the NCSD or another suitable format. These individuals will also map the planned activities of institutions that contribute to the implementation of measures, as well as verify funding sources—whether they are institutional or come from alternative sources. Thus, more efficient implementation of measures and optimal use of available resources will be ensured.

The program development will require inputs from a range of stakeholders across all priority sectors. An integrated climate risk assessment should be conducted to find the priority risks and vulnerabilities which are common across all sectors. For this, the findings of the NAP can be used as a foundation. The program will be developed from within the sectoral departments to ensure that a program is developed which functions effectively and responds to the needs of the sectors. It is advised that the program should strongly feature gender and equity considerations and support the populations/ ecosystems that are most vulnerable to climate change.</td></tr>
<tr><td>Vulnerability / Risk Addressed</td><td>Applicable to all risks and vulnerabilities</td></tr>
<tr><td>Strategic and Operational Objectives Supported</td><td>This measure specifically contributes to achieving the following element of the NAP Vision: ‘Build and develop capacities for evidence-based planning, implementation and monitoring of a wide range of adaptation measures, knowledge sharing and coordination’. It also seeks to target the following objectives:

TSO 3. Establishing/strengthening multi-sector coordinated approaches and mechanisms to strengthen preparedness for early warning and planning for climate change.
ASO 1. Gathering of high-resolution expert data and integration of local knowledge for the improved intersectoral planning and evidence-based prognosis.</td></tr>
<tr><td>Linkage to Existing Policies/Plans</td><td>NAP Document
National Strategy for Sustainable Development
National Strategy for Climate Change 2030</td></tr>
<tr><td>Gender and Equity Considerations and Implications</td><td>The integrated climate risk assessment and subsequent projects will include strategies to address potential disparities in the impact of climate risks and adaptation measures across different communities.</td></tr>
<tr><td>Status of Preparation</td><td>Project idea</td></tr>
<tr><td>Implementation Process and Timeline</td><td>
<table>
<tr><th>Step</th><th>Duration</th><th>Task Owner / Support Required</th></tr>
<tr><td>Identify the key sectoral stakeholders and form a program team</td><td>12 months</td><td>Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD</td></tr>
</table>
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	Establish a coordination mechanism to ensure roles and responsibilities are clear and devise a plan for the creation of the program.	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, MONSTAT, NCSD
	Conduct integrated climate risk assessment	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Design a project or set of projects which address these risks	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Prepare a financing plan	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Implement program	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Integrate Monitoring, Reporting and Verification (MRV) to NAP Program	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
Measures Owner(s)	NCSD		

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6+
Form a project team						
Establish coordination mechanism and devise plan						
Conduct integrated climate risk assessment						
Design project(s)						
Prepare financing plan						
Implement program						
Integrate MRV						

Stakeholders

Stakeholder group	Engagement
Ministry of Tourism	Program team and coordination.
Ministry of Agriculture, Forestry and Water Management	Involved in implementation of the program.
Ministry of Health	Responsible for supporting MRV.

<table>
<tr><td></td><td>Ministry of Interior</td><td colspan="3">Advisory role through participation in the implementation team and provision of available data and expertise.</td></tr>
<tr><td>Indicative Costs</td><td>CapEx [€]</td><td>OpEx over 5 years [€]</td><td colspan="2">Development / Advisory Costs [€]</td></tr>
<tr><td></td><td>490.000</td><td>780.000</td><td colspan="2"></td></tr>
<tr><td>Potential Financing Instruments and Sources</td><td colspan="4">
<table>
<tr><th>Instrument (Own-Source, Grant, Debt, Equity, Other)</th><th>Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other</th><th>Amount € / Share %</th><th>Napomena.</th></tr>
<tr><td>Own Source</td><td>National Government</td><td>20%</td><td rowspan="2">In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.</td></tr>
<tr><td>Grant</td><td>International Development Partner</td><td>80%</td></tr>
</table>
</td></tr>
<tr><td>Impact Measures (Quantitative and Qualitative Indicators)</td><td colspan="4">Number of cross-sectoral projects/ initiatives focused on climate adaptation launched annually.
Number of cross-sectoral meetings held on climate adaptation per year.
€ spent per year on intersectoral climate risk reduction projects.</td></tr>
<tr><td>Co-Benefits</td><td colspan="4">Economic improvements through cost reduction (through synergies between departments) and through finance generating projects.
Job creation through new projects.
Economic stability (through mitigation of risks).
Social cohesion (through working with diverse groups of stakeholders).</td></tr>
</table>

Potential Project Risks and Mitigation Options

Area	Risks	Mitigation Options
Social	Limited to only four sectors Ministries reluctant to cooperate, lack of human capacity or clear mandates for CCA and finances	If successful, the programme can be extended to other sectors or levels of government e.g. regional and local In initial meetings a clear presentation will be made on the importance of intersectoral planning and coordination to address risks. Develop a protocol for cooperation to be signed
Environmental	Projects to address climate risks have negative impacts on biodiversity or sensitive ecosystems. The most vulnerable communities are not included effectively in projects	Any new projects will include diverse stakeholder engagement including with ecologists and biodiversity experts to understand any possible impacts on ecosystems Perform environmental impact assessment and Strategic impact assessment where appropriate and in accordance with the relevant legislation. The integrated climate risk assessment will proactively identify the most vulnerable communities across the sectors. Any new projects will include a full environmental social impact assessment (or similar) to maximise positive impacts for vulnerable communities.
Economic	Excessive or high costs to deliver the programme effectively.	The business case for acting and supporting this measure will be articulated and the cost-benefit argument made
Other	N/A	

CC2.1.2	**Improve communication structures between the scientific/ research community, public institutions responsible for planning, and the commercial sector and establish an intersectoral body and processes regarding climate change e.g. NCSD to arrange two round-table workshops for each key sector, each year, to discuss the nexus between policy, research, business, programming for each sector with regards to climate change.**
Measure Type	Policy, Capacity development and Institutional strengthening
Description	Adapting to climate change will require different sectoral stakeholders working together, sharing information, and working in a holistic way, as the climate risks faced by Montenegro are complex and multifaceted. This will require the research community, public institutions and the commercial sector to work collaboratively to tackle these issues and exploit any opportunities. Research Community: The research community plays a crucial role as they can use their expertise to identify climate risks and interpret how different regions and sectors will be impacted. They may also be effective at developing adaptation strategies and technologies. By collaborating with the public institutions, they can ensure their findings are translated into effective policies and solutions. Public Institutions: The public institutions that have a key role in funding and implementing adaptation programs and policies. They also have the power to create the enabling environment and legislative framework to incentivize the commercial sector. Civil Society Organizations: Play a role in the implementation of programs, raising awareness and the engagement of a wider set of stakeholders. They also hold a high degree of knowledge of the issues and drivers of vulnerabilities of the groups at most risk to climate change. Commercial Sector: Has a key role in investing in new climate resilient technologies and infrastructure. They also can use information from the scientific community to adapt their business models to reduce the impact of climate change on their organizations or to access benefits arising from climate change. To enhance these connections and relationships, the NCSD will arrange two round-table workshops for each key sector, each year, to discuss the nexus between policy, research, business and programming for each sector with regards to climate change adaptation. The outputs of these workshops will be institutional strengthening and relationship development with projects/initiatives and research ideas that will contribute to climate change adaptation. The workshops will support information sharing on climate change and policy briefs as well as to support the collection and sharing of data between all relevant stakeholders (including environmental, meteorological and socio-economic data sets). The workshops should capture all resulting actions and assign these to respective stakeholders to both implement and monitor.
Vulnerability / Risk Addressed	Applicable to all risks and vulnerabilities
Strategic and Operational Objectives Supported	**CCOO 2.1** Improve inter-sectoral collaboration to tackle climate change in a just and equitable way
Linkage to Existing Policies/Plans	National Strategy for Sustainable Development - thematic field 5
Gender and Equity Considerations and Implications	The action will enable better communication between diverse groups and inclusion of a variety of stakeholders in climate change adaptation. Workshops will be constructed to include a diverse range of perspectives, encompassing balanced participation including striving for equal participation from men and women.

Status of Preparation	Project idea

Implementation Process and Timeline

Step	Duration	Task Owner / Support Required
Establish team and allocate project roles	6 months	Ministry of Ecology, Sustainable Development and Northern region Development, NCSD
Identify key stakeholders from across the research community, public institutions and the commercial sector for each sector	3 months	Ministry of Ecology, Sustainable Development and Northern region Development, NCSD
Arrange a round table meeting every six months for each sector *The organising team should identify a chair and send an agenda ahead of the meeting.*	3 months	Ministry of Ecology, Sustainable Development and Northern region Development, NCSD
Share meeting notes, actions and outcomes of each meeting *Actions should be assigned and tracked.*	1 month	Ministry of Ecology, Sustainable Development and Northern region Development, NCSD
Monitor and evaluate the impact of meetings and track actions and outcomes	Ongoing	Ministry of Ecology, Sustainable Development and Northern region Development, NCSD

Measures Owner(s)	NCSD

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-10
Establish team and allocate project roles						
Identify key stakeholders						

	Arrange a round table meeting every 6 months for each sector						
	Share meeting notes						
	Monitor and evaluate						

Stakeholders

Stakeholder group	Engagement
NCSD	Coordinate the process, through the work of thematic working groups
Research community	Provide data and support
Civil sector (NGOs)	Provide data and support Information dissemination
Commercial sector (Chamber of Economy and its coordination boards, key enterprises)	Provide data and support Information dissemination

Indicative costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
80.000	220,000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note:
Own Source	National Government	Own Source	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Grant	International Development Partner	Grant	

Impact Measures (Quantitative and Qualitative Indicators)

Number of annual sectoral climate adaptation meetings;

Number of post-workshop actions completed;

Number of organizations/ stakeholders attending workshops;

% of women participating in workshops.

Co-Benefits

Improved cooperation, knowledge base and funding will assist tackling other environmental and social issues in Montenegro.

Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation options**
	Social	Lack of capacity of organizations and stakeholders to full participate and engage in workshops Lack of willingness to cooperate and work collaboratively Exclusion of vulnerable and marginalized populations from workshops and/ or through implementation of actions	Technical support will be provided where appropriate and expenses covered for NGOs. Initial workshops will include a clear introduction and discussion on the benefits and importance of transparency and collaboration and provide examples of previous successes. Prepare protocols of cooperation and ensure participants adhere to them Diversity within the workshops will be prioritized with all participating organizations encouraged to provide a range of individuals to participate in workshops. Where appropriate, any actions which could have adverse impacts will require a social impact assessment or alternative assessment.
	Economic	High financial costs of agreed actions resulting in lack of impact	All actions to be thoroughly discussed within workshops and, where appropriate, a cost benefit analysis of all actions to be conducted.
	Environmental	N/A	N/A
	Other	N/A	N/A

CC2.1.4.	**Educational Programs in schools, higher education (University/LLLs), and relevant sectoral institutions, that raise levels of awareness, capacity and preparedness of climate change and its impact.**
Measure Type	Policy, Capacity development and Institutional strengthening
Description	At all levels, the awareness of, coping capacities and preparedness for climate change are distinctly lacking in Montenegro. There is little common understanding of what, how and why Montenegro needs to adapt to climate change. This lack of awareness and knowledge, contributes to the high vulnerability of communities and infrastructure to climate risks and hinders the ability to mitigate impacts or to maximize any opportunities which might arise with climate change. To address this, educational programs will be developed and rolled out to various levels of the education system from secondary schools to higher education (University and Lifelong Learning Institutions (LLLs) and further extended to key governmental departments. Secondary schools - The school curriculum will be reviewed and updated to more comprehensively incorporate climate change adaptation and mitigation. The new curriculum will be supported by public awareness raising campaigns to inform parents, guardians and communities about the importance of climate change education. University and LLLs - The course offering at universities will be reviewed and additional courses and modules will be identified and integrated into the offering of universities and LLLs. The new offering of courses and modules will further the knowledge and interest of students from secondary schools in climate change adaptation and mitigation practices and increase the skill level of the future workforce. For both secondary schools and universities/ LLLs, professional development programs will be provided to teachers to enhance their understanding and knowledge of climate change, to equip them with the skills to effectively and engagingly teach the subject to students. Example lesson plans, teaching materials and resource kits will be made available to institutions in educationally disadvantaged or poor areas to ensure all students are provided equal opportunities to learn.

	Government departments: The current training offering for government departments and sectoral teams will be reviewed. A revised training and capacity development program will be developed and rolled out across departments, with compulsory training for key sectors likely to be significantly impacted by climate change (including agriculture, water resources, health and tourism). For these vulnerable sectors, specialized programs will be developed tailored to the risks and needs of the sector staff. A monitoring and evaluation framework will be developed to monitor the ongoing impact of the revised syllabus. This will include development of tools to measure the effectiveness in increasing awareness, building capacity and preparedness for climate change. Feedback mechanisms will be established to gather input from students, educators and participants from all training programs to allow for continuous improvement.
Vulnerability / Risk Addressed	Lack of awareness and low adaptive capacity of farmers to respond to climate change Insufficient number of healthcare professionals and lack of capacity on climate related risks Lack of specific climate adaptation policy guidance and active/ effective sustainability framework Deficient water management system with low-risk reduction capacities
Strategic Objective and Operational Goals Supported	**ASO 2.** Capacity building on climate change adaptation in order to provide a resilient food production system. **HSO 1.** Improved human and technical capacities of the health sector to provide timely planning and response to climate hazards, with a particular focus on marginalized groups. **TSO 1.** Training and capacity building for all relevant stakeholders in the tourism sector to improve know-how and skills for the transformation of the tourism sector in the face of climate change and for obtaining support on implementing the adaptation activities. **WSO 2.** Improved capacities for preparation and response to extreme hydrological weather events to reduce injury, deaths and infrastructure damages.
Linkage to Existing Policies/Plans	National Strategy for Sustainable Development Measure 5.3.2. Strategy for Higher Education 2021-2025 Strategic objective 1 Strategy for Development of Expert Education 2020-2024 Strategy for Education of Teacher 2017-2024 Strategy for the Education of Adults 2015-2025
Gender and Equity Considerations and Implications	New capacity building programs will take a gender sensitive lens of climate change and adaptation. New courses and modules will be developed by a diverse group of practitioners to ensure the content represents a range of perspectives. Resources and support will be provided to education facilities in poor or marginalized areas to ensure climate change education is fairly provided to all students. Ongoing monitoring and evaluation and feedback mechanisms allow courses and modules to be quickly adapted to the needs of all participants.
Status of Preparation	Project idea
Implementation Process and Timeline	

Step	Duration	Task Owner / Support Required
Assemble a team incorporating stakeholders from a range of institutions of the different levels (secondary, higher, university, LLLs) within the education system and within key sectoral institutions.	2 Months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
Identify the key gaps within the current education system and relevant institutions for climate change issues specifically adaptation.	6 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
Prepare a plan for the future educational curriculum and capacity building (updating curriculum, adding courses/ modules, standalone training).	6 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
Procure service providers and develop content and material.	18 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD

	Develop monitoring and evaluation framework.	3 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Develop awareness raising campaign.	4 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Provide training to education practitioners.	3 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Launch awareness raising campaign.	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Roll out new courses/ modules/ curricula/ training.	12 months	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD
	Monitoring and evaluation.	Ongoing	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD

Timeframe

Activity	Year 1	Year 2	Year 3	Year 4+
Assemble Team				
Identify gaps in education system				
Prepare future plan				
Procure services and develop content and material				
Develop monitoring and evaluation framework				
Develop awareness raising campaign				
Provide training to education practitioners				
Launch awareness raising campaign				
Rollout new courses/ modules/ curricula and training				

	Monitoring and evaluation					

Measure Owner(s)

Bureau of Educational Service

Stakeholders

Stakeholder Group	Engagement (Inform, Consult, Involve, Collaborate, Empower)
Ministry of Education, Science and Innovations	Oversee the process
Bureau of Educational Services	Coordinate the process Revise the primary and secondary school curricula
Agency for control and quality assurance of higher education	Accreditation of new curricula in higher education
Universities	Develop and implement new curricula
Schools	Develop and implement new curricula
Stakeholder Group	**Engagement (Inform, Consult, Involve, Collaborate, Empower)**

Indicative Costs

CapEx [€]	OpEx over 5 years [€]	Development / Advisory Costs [€]
510.000	980.000	

Potential Financing Instruments and Sources

Instrument (Own-Source, Grant, Debt, Equity, Other)	Source (Municipal Government, State-Owned Enterprise, National Government, Private Sector, International Development Partner, Other	Amount € / Share %	Note
Own Source	National Government	20%	In the period leading up to the EU accession, implementation will focus on securing funds from allocations intended for Montenegro within the framework of the Adaptation Fund, GCF (Green Climate Fund) Readiness, and GEF (Global Environment Facility), as well as other sources of funding, which are currently estimated at more than 20 million USD. The plan is to form project teams, in coordination with the line ministry. The teams will have the task of securing these funds. The national budget will be considered as a potential source of funding only after exhausting all available international opportunities. After joining the EU, Montenegro will be required to align its climate change adaptation policy with European regulations, including the EU Strategy on Climate Change Adaptation, Fit for 55, the Green Deal, and so on. This means that the implementation of measures will become an obligation, but at that point, EU funds will also be available to provide significant financial support.
Grant	International Development Partner	80%	

Impact Measures (Quantitative and Qualitative Indicators)

Number of university courses with climate change adaptation content	Baseline
Number of students enrolled on courses with CCA content per annum	Baseline
Number of people working in climate change adaptation	Baseline
Number of stakeholders completing training on CCA per annum	Baseline
Number of pupils receiving CCA education	Baseline
% of pupils self-reporting a good understanding of climate change adaptation	Baseline

Co-benefits	Creation of green jobs; Reduced inequalities; Improved coordination between secondary education, universities and government departments.		
Potential Project Risks and Mitigation Options	**Area**	**Risks**	**Mitigation Options**
	Social	Some groups may perceive the greater integration of climate change into the education system as politically motivated Lack of interest by students and employees in these topics	Engage a wide range of stakeholders to communicate the importance of climate change education and the direct benefits to Montenegro The curriculum changes will be supported by a country-wide awareness raising campaign to support communities to understand the importance of the topic Courses and modules will be publicized and supported by an awareness raising campaign.
	Environmental	N/A	N/A
	Economic	Unforeseen costs associated with the curricula development, courses accreditation, payments for teachers and materials etc.	The initial identification of gaps in the education curriculum and planning will be cognisant of the budgets imposed on schools and higher education facilities.
	Other	N/A	

Annex C: Indicator passport

Agriculture sector indicators

Category	Description		
Title of the basic indicators for the agricultural sector. **Note: the tables below describe the indicator passports that need to be developed during the CCAP implementation.**	Number of analyses Number of trained individuals Surface area Number of financial schemes Number of policies or strategies developed and adopted	**Unit**	Number of persons Number Ha Number Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** • **AOO 2.1. Raise capacities of farmers to adapt to climate change.** • **AOO 3.1. Ensure minimal losses of yields through implementation of adequate technical measures.**		
Short description	The activities are aimed at strengthening the capacity of farmers and decision-makers to adapt to climate change through training, research and innovative technical solutions. The aim is to ensure minimal yield losses through climate-smart practices, improve policies and financial incentives, and encourage sustainable management of pastures and livestock farming. A special focus is on piloting technologies, local feed production, improving infrastructure and promoting cost-effective and sustainable solutions, thereby strengthening the resilience of the agricultural sector and rural communities. .		
Data type	Quantitative	**Data source**	Progress reports on the CCAP implementation.
Responsible institution	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD		
Frequency of data collection	Monthly and annually	**Frequency of reporting**	Annually
Description of the methodology	The reporting methodology is based on the regular collection, analysis and presentation of data that reflect the progress of the implementation of activities and the achievement of objectives. Key steps include: Defining success indicators: clearly defining quantitative and qualitative indicators to monitor the impact of activities. Data collection: the use of surveys, interviews, field visits, administrative reports and technological tools such as satellite tracking and drones. Frequency of reporting: preparation of quarterly operational reports, annual comprehensive reviews and a final report on the results achieved. Data analysis: the use of descriptive and comparative analysis to evaluate progress against set goals. Transparency and communication: reports are delivered to relevant stakeholders, including farmers, decision-makers and funders, through meetings, workshops and digital platforms. review and adjustment: based on the report findings, activities are adjusted to improve their effectiveness.		
Initial data (2023)	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are set at zero. This is done because relevant data are currently not available in the context of CCAP and in order to be able to measure the direct impact of the CCAP measures. Quantitative indicators: Number of analyses prepared with the aim of better understanding the consequences of climate change. Number of farmers/decision-makers trained in climate-smart practices. Number of implemented technological solutions (e.g. irrigation systems, protective nets, solar panels). Number of financial incentives created and implemented for farmers.		

	Number of policies or strategies designed and adopted to support climate change adaptation. In addition, indirect benefits include: Area of pastures used under improved management (e.g. rotation of livestock, electric fences). Increase in local feed production (e.g. hectares under specific crops). Qualitative indicators: Increased farmers' awareness and knowledge about climate change and adaptive measures. Improved farmers' perception of the sustainability of new practices. Barriers to the implementation of climate-smart measures identified and reduced. Increased customer satisfaction with financial and technical support programs.
Medium-term reference framework 2025 - 2030	Quantitative indicators: 7 - Number of analyses prepared to better understand the consequences of climate change impacts. 500 - Number of farmers/decision-makers trained in climate-smart practices. 20 - Increase in the number of implemented technological solutions (e.g. irrigation systems, protective nets, solar panels). 3 - Number of financial incentives created and implemented for farmers. 2 - Number of policies or strategies developed and adopted to support adaptation to climate change. In addition, the following indirect benefits will be monitored: 500 ha - Increase in local feed production (e.g. hectares under specific crops). 500 ha - Area of pastures used under improved management (e.g. rotation of livestock, electric fences). Qualitative indicators: Increased farmers' awareness and knowledge about climate change and adaptive measures. Improved farmers' perception of the sustainability of new practices. Barriers to the implementation of climate-smart measures identified and reduced. Increased customer satisfaction with financial and technical support programs.
Long-term reference framework	Quantitative indicators: 10 - umber of analyses prepared with the aim of better understanding the consequences of climate change. 1000 - Number of farmers/decision-makers trained in climate-smart practices. 50 - Increase in the number of implemented technological solutions (e.g. irrigation systems, protective nets, solar panels). 6 - Number of financial incentives created and implemented for farmers. 3 - Number of policies or strategies developed and adopted to support adaptation to climate change. In addition, the following indirect benefits will be monitored: 2000 ha - Increase in local feed production (e.g. hectares under specific crops). 2000 ha - Area of pastures used under improved management (e.g. rotation of livestock, electric fences). Qualitative indicators: Increased farmers' awareness and knowledge about climate change and adaptive measures. Improved farmers' perception of the sustainability of new practices. Barriers to the implementation of climate-smart measures identified and reduced. Increased customer satisfaction with financial and technical support programs.
Target trend	Continuous increase
Additional information	

A.1: Days of agricultural drought on an annual basis

Category	Description		
Indicator name	Days of agricultural drought on an annual basis	**Unit**	Days
Indicator category	Climate impact		
Objectives	**Operational objectives:** • **AOO 1.2.** Enable informed decision making through monitoring and data collection, storage and sharing. • **AOO 3.1.** Ensure minimal losses of yields through implementation of adequate technical measures. **Adaptation measures:** • **A 1.2.1.** Capacity building of the agro-meteorological services, including improving the monitoring network and reporting and dissemination of information. • **A 3.1.3.** Implement Irrigation infrastructure for drought resilience.		
Short description	Dry spells, or agricultural droughts, can have a serious impact on agricultural production, leading to reduced yields, financial losses for farmers, and wider economic challenges. Monitoring agricultural droughts is crucial to help farmers and decision-makers prepare for and adapt to the impacts of climate change, thereby ensuring food security and economic stability. The Institute for Hydrometeorology and Seismology of Montenegro monitors this indicator in order to provide timely and accurate information to farmers and policymakers. This helps them develop effective strategies for drought preparation and climate change adaptation. Agricultural drought: Agricultural drought is defined as the deviation of the Standardized Precipitation Index (SPI3) from the Climate Normative Index. Specifically, an agricultural drought is considered to take place when the SPI3 value is less than -1. This value indicates a period of insufficient precipitation in relation to the historical norm. Agricultural drought can also be identified by days when rainfall is not sufficient to meet the water needs of plants. A common limit for this is less than 1 mm of precipitation per day. When precipitation falls below this threshold, it is often not enough to support healthy plant growth, leading to stress in agricultural production.		
Data type	Quantitative	**Data source**	Institute for Hydrometeorology and Seismology
Responsible institution	Institute for Hydrometeorology and Seismology		
Frequency of data collection	Monthly and annually	**Frequency of reporting**	Annually
Description of the methodology	The following methodological approach has been developed in accordance with the current definitions and the drought monitoring approach of the Institute for Hydrometeorology and Seismology. These steps should be taken regularly to collect data for this indicator: 1. **Data collection**: ○ A network of meteorological stations is used to collect temperature and precipitation data. ○ Daily precipitation data is recorded from 33 measuring stations, covering three periods: at 7:00, 14:00, and 21:00 local time. ○ Daily precipitation is defined for a 24-hour period, from 7:00 a.m. on the previous day to 7:00 a.m. on the current day. 2. **Drought monitoring**: ○ **Standardized Precipitation Index (SPI):** ▪ The SPI values are calculated at different intervals: 30, 60, 90, 120, 150, 180, 270 and 360 days. ○ **Vegetation indices**: ▪ Monthly displays of Vegetation Cover Fraction (FVC) and Leaf Area Index (LAI). ▪ Data from the Surface Soil Analysis Satellite Application (LANDSAF) are used. 3. **Drought data tracking**: ○ Monitoring drought data on a daily basis. ○ Calculate the total number of days of agricultural drought per month and year. 4. **Reporting**: ○ Publication of monthly reports indicating drought trends by municipalities.		

	○ Ensuring that the reports are based on the data from the SPIi Vegetation Index without specifying the exact number of drought days. ○ Monthly reports counting the number of days in the previous year when there was an agricultural drought. The data can be found at: https://www.meteo.co.me/page.php?id=49 and https://www.meteo.co.me/page.php?id=43 for the monthly analysis.
Baseline data (2023)	Number of agricultural droughts per year for 2023: *Source:* Institute for Hydrometeorology and Seismology https://www.meteo.co.me/page.php?keyword=reports
Medium-term reference framework	Number of agricultural droughts per year for 2025-2030: *Source:* Institute for Hydrometeorology and Seismology https://www.meteo.co.me/page.php?keyword=reports
Long-term reference framework	Number of agricultural droughts per year for 2030-2035: *Source:* Institute for Hydrometeorology and Seismology https://www.meteo.co.me/page.php?keyword=reports
Target trend	Monitor drought data daily, calculate the total number of agricultural drought days per month and year, and use it as a planning factor.
Additional information	Drought is intermittent, but dryness is a constant feature of the climate in Montenegro. Summer, especially July, is especially dry on the coast and in Podgorica. It is important to distinguish between seasonal drought and dryness because they are often confused, but they are different phenomena. This distinction is crucial for effective drought monitoring, early warning systems, and preparedness plans. Drought can occur in both areas with high and low precipitation in all climatic regimes. In Montenegro, minimal precipitation usually occurs in July.

A.2: Change in the agro-phenological phase of cultivated drops (in days)

Category	Description		
Indicator name	Change in the agro-phenological phase of cultivated crops (in days)	Unit	Days
Indicator category	Climate impact		
Objectives	Operational objectives: • **AOO 1.2.** Enable informed decision making through monitoring and data collection, storage and sharing. • **AOO 3.1.** Ensure minimal losses of yields through implementation of adequate technical measures. Adaptation measures: • **A1.2.3.** Implementation of models for simulating crop yields and predicting plant diseases and improve the phenological database, supported with a data collection and management system.		
Short description	This indicator refers to changes in time when certain phenological phases of plants occur, such as flowering, fruiting, maturation, etc. In agrometeorology, phenological data, in addition to meteorological data, form the basis for studying the influence of weather and climate on plant development. They represent the biological boundaries within which the relationship of plants to external conditions is examined. Plants are key indicators of changes in weather and climate conditions. Phenological data can be used in a variety of ways, for example as a basis for phenochromatological tests, on the basis of which bioclimatic indicators can be obtained for each agricultural crop that provide information about the heat and moisture needs of a particular plant at each stage of its development.		

	In Montenegro, phenological observations have been systematically made since 1951, in seven categories: • Fruit trees; • Grapevine; • Forest species; • Agricultural crops; • Plant diseases and pests; • Bees; • General agriculture. The information is available at: https://www.meteo.co.me/page.php?id=45		
Data type	Quantitative	Data source	Institute for Hydrometeorology and Seismology
Responsible institution	Institute for Hydrometeorology and Seismology, Department of Applied Meteorology and Climate Change		
Frequency of data collection	Annually	Frequency of reporting	Annually
Description of the methodology	The following methodological approach has been developed in accordance with the current definitions and the monitoring approach of the Institute for Hydrometeorology and Seismology for monitoring phenological changes (in days). **1. Define a list of cultivated plants** to be monitored/observed for this indicator. 2. Define phenological changes: - Track how temperature, precipitation, and other climatic factors affect phenological phases, record shifts in time. 3. Data Collection: - Use a phenological database with data from seven active meteorological stations. - Classify data by station, type of cultivated plants and variety. 4. Analyze shifts: - Compare current data on cultivated plants with historical averages to identify shifts. For example, the shift from April 15 to April 5 over ten years is -10 days.		

	5. Categorize the data: - Sort the data into categories: very early, early, average, late, very late. 6. Generate reports: - Produce reports for current data and median dates for specific phenophases per cell, species or variety.
Baseline data (2024)	Shift of agro-phenological phases of cultivated plants (number of days) by categories 2024: *Source:* Institute for Hydrometeorology and Seismology https://www.meteo.co.me/page.php?id=45
Medium-term reference framework	2025 – 2030
Long-term reference framework	2030 - 2035
Target trend	Increase the accuracy of phenological phase and yield predictions using simulation models by at least 20% compared to current levels. Provide farmers with access to reliable data and decision-making tools to adapt to change. The goal is to reduce the occurrence of plant diseases associated with climate change through improvement of phenological databases and predictive models.
Additional information	-

A.3: Number of frost days during the growing season

Category	Description		
Indicator name	Number of frost days during the growing season	**Unit**	Days
Indicator category	Climate impact		
Objectives	**Operational objectives:** • **AOO 1.2**. Enable informed decision making through monitoring and data collection, storage and sharing. **Adaptation measures:** • **A 1.2.1.** Capacity building of the agro-meteorological services, including improving the monitoring network and reporting and dissemination of information.		
Short description	Frost days, defined as days with a minimum daily temperature equal to or lower than 0°C, can have a serious impact on agricultural yields, plant growth and the overall economy of the agricultural sector. Tracking the number of frost days is essential for helping farmers and decision-makers mitigate the negative effects of frost, thereby increasing agricultural productivity and economic resilience. In the growing season, which in Montenegro covers the period from March to November, the occurrence of frost days can threaten the productivity of agricultural crops. The number of frost days during the growing season is an important indicator monitored by the Institute of Hydrometeorology and Seismology of Montenegro. Climate change can lead to variations in temperature patterns, including the occurrence of unexpected frost days. By monitoring the number of frost days during the growing season, the Institute for Hydrometeorology and Seismology of Montenegro can help identify changes in frost patterns and provide crucial data for the preparation of adaptation strategies to protect agricultural crops from frost-induced damage.		

Data type	Qualitative	**Data source**	Institute for Hydrometeorology and Seismology
Responsible institution	Institute for Hydrometeorology and Seismology, Department of Applied Meteorology and Climate Change		
Frequency of data collection	Monthly (November-March)	**Frequency of reporting**	Annually
Description of the methodology	The following methodological approach has been developed in accordance with the current definitions and the frost monitoring approach of the Institute for Hydrometeorology and Seismology. These steps should be taken monthly and annually to collect data for this indicator: **1. Define days with frost.** **2. Collect daily temperature data:** • Use the national network of meteorological stations to collect daily temperature data. • Use two operational databases: o Phenological database: data from 25 phenological cells. o Soil temperature database: data from 11 agrometeorological stations that measure temperatures at depths of 2, 5, 10, 20, 30, 50 and 100 cm. **3. Frost data tracking:** • Record when frost occurs, which municipalities are affected, and which agricultural crops are threatened. **4. Identify frost days:** • Report on the number of frost days for each month during the growing season (March-November) By following these steps, the Institute ensures systematic monitoring and reporting on frost days and their impact on agriculture.		
Initial data (2024)	0 - The reports do not contain the number of frost days. Instead, they provide information when the frost occurred.		
Medium-term reference framework	Reference framework formed through the publication of data on the total number of frost days with a reference year 2026.		
Long-term reference framework	Number of frost days in 2026 and beyond.		
Target trend	Continuous publication of data on the total number of frost days.		
Additional information	Frost data are monitored on a daily basis, while the Institute for Hydrometeorology reports on a monthly basis. The reports do not contain the number of frost days. Instead, they provide information when the frost occurred, in which municipalities and on which agricultural crops it caused damage. In the coming period, the plan is also to publish data on the total number of frost days. Monitoring this indicator is crucial for adapting agricultural practices and developing strategies to reduce the negative effects of frost on agriculture.		

A.4: Area (in ha) of agricultural land subject to the combined practice

Category	Description		
Indicator name	Area (ha) of agricultural land subject to the combined practice.	**Unit**	Hectare (Ha)
Indicator category	Result of adaptation		

<table>
<tr><td>Objectives</td><td colspan="3">Operational objective:
• AOO 2.1. Raise capacities of farmers to adapt to climate change.
Adaptation measure:
• A2.1.1. Raise capacities and awareness on combined production practices.</td></tr>
<tr><td>Short description</td><td colspan="3">Combined production practices refer to a range of techniques and strategies that farmers can employ to increase resilience to climate threats. These practices provide protection or an alternative source of income when the dominant crop or livestock production fails due to adverse weather events. The application of combined practices is crucial for maintaining agricultural productivity and economic stability in the face of climate change.
Combined practices: These include a variety of techniques, such as:
• Growing different crops on the same field (intercropping).
• Planting varieties of the same crop with different growth cycles (gradual cropping).
• Combining agricultural and livestock production (agro-pastoral systems).
• Diversification of agricultural systems to include additional types of crops and livestock.
Agricultural land: The total area of land in hectares to which these combined practices are applied.
Climate change increases the risk of adverse weather events such as droughts, floods and temperature extremes. By adopting combined practices, farmers can diversify their production systems and reduce dependence on a single crop or type of livestock. This improves the resilience of agricultural systems, and ensures more stable yields and income despite climate variability.</td></tr>
<tr><td>Data type</td><td>Quantitative</td><td>Data source</td><td>Directorate of Statistics - MONSTAT</td></tr>
<tr><td>Responsible institution</td><td colspan="3">Statistical Administration of Montenegro - MONSTAT
Department for Agriculture, Fisheries, Business Statistics and Environment and Forestry, in cooperation with the Biotechnical Faculty</td></tr>
<tr><td>Frequency of data collection</td><td>Annually</td><td>Frequency of reporting</td><td>Annually</td></tr>
<tr><td>Description of the methodology</td><td colspan="3">The methodological approach and the final methodology for the indicator should be developed through cooperation between MONSTAT (Statistical Administration of Montenegro) and the Biotechnical Faculty. Below are the suggested key steps:
1. Definition of Combined Agricultural Practices:
MONSTAT and the Biotechnical Faculty jointly define combined agricultural practices in the Montenegrin context, which may include integrated crop and livestock production systems, agroforestry, crop rotation and other sustainable practices.
2. Identifying the source of the data:
Use statistical data collected by MONSTAT, including agricultural surveys, census data, and existing databases that track land use and agricultural practices.
3. Data analysis:
Based on the defined data requirements, collect data from various MONSTAT sources, in cooperation with the Biotechnical Faculty.
○ Prepare data by identifying the number of farms that use the relevant combined practices, and then sum up the total area of these farms (in ha).
4. Review and update:
○ Periodically review the methodology or introduce additional questions within existing surveys, based on the recommendations of the previous calculation (shortcomings identified by MONSTAT and the Biotechnical Faculty).
○ Following these steps, the indicator "Area of agricultural land (ha) subject to combined practices" will be systematically monitored and reported and provide valuable insights on sustainable agricultural practices in Montenegro.
https://monstat.org/eng/page.php?id=62&pageid=62</td></tr>
<tr><td>Initial data (2024)</td><td colspan="3">The methodological approach and the final methodology for the indicator should be developed through cooperation between MONSTAT (Statistical Administration of Montenegro) and the Biotechnical Faculty.</td></tr>
<tr><td>Medium-term reference framework</td><td colspan="3">The methodological approach and the final methodology for the indicator should be developed through cooperation between MONSTAT (Statistical Administration of Montenegro) and the Biotechnical Faculty.</td></tr>
<tr><td>Long-term reference framework</td><td colspan="3">The methodological approach and the final methodology for the indicator should be developed through cooperation between MONSTAT (Statistical Administration of Montenegro) and the Biotechnical Faculty.</td></tr>
</table>

Target tendency	Increase
Additional information	-

A.5: Area of vineyards at an altitude above 600m

Category	Description		
Indicator name	Area of vineyards at an altitude above 600m.	**Unit**	Hectare
Indicator category	The result of adaptation		
Objectives	**Operational objectives:** o **AOO 1.2.** Enable informed decision making through monitoring and data collection, storage and sharing. **Adaptation measure:** • A1.2.1. Capacity building of the agro-meteorological services, including improving the monitoring network and reporting and dissemination of information.		
Short description	Changes in temperatures, precipitation and other climatic factors can significantly affect the optimal conditions for growing vines, which directly affects the yield and quality of grapes. Vineyards are particularly sensitive to these changes. Higher temperatures can accelerate the ripening of grapes, potentially leading to a mismatch between sugar accumulation and phenolic ripeness, which can affect the quality of the wine. Also, changes in rainfall patterns can affect the health of the vines, with both droughts and excessive rainfall posing challenges such as water stress or fungal diseases. To mitigate the impact of climate change, winegrowers can iapply several strategies. One of these strategies is to move vineyards to higher altitudes, where temperatures tend to be cooler and the risk of extreme heat and drought is reduced. This altitudinal shift can help maintain the delicate balance needed to produce high-quality grapes. By monitoring this change, one can monitor the adaptation of winegrowers and understand the impact of climate on wine production.		
Data type			
Quantitative	**Data source**	Ministry of Agriculture, Forestry and Water Management	
Responsible institution	Ministry of Agriculture, Forestry and Water Management Directorate of Plant Production Vineyard Register		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	The following methodological approach should be applied annually to ensure accurate data collection and analysis: **1. Define scope and criteria:** The Ministry of Agriculture, Forestry and Water Management/Directorate fro Plant Production should establish specific criteria for the identification of vineyards located at an altitude above 600 m. **2. Identify source of the data:** Use the Vineyard Register maintained by the Ministry of Agriculture, Forestry and Water Management. **3. Data collection and analysis:** If there is no information in the Vineyard Register about vineyards located at an altitude above 600 m, include this criterion/field as mandatory. Calculate the total area (in hectares) of these vineyards. Perform field surveys and use remote sensing technology to map vineyard locations and verify their altitudes.		

	Following these steps, the indicator "Vineyard area above 600 m above sea level" will be systematically monitored and reported, providing valuable insights into winegrowers' adaptation strategies in response to climate change.
Initial data	2,945 ha - it is necessary to include information on vineyards located at an altitude of more than 600 m, include this criterion/field as mandatory.
Medium-term reference framework	Area increase of 0.5%.
Long-term reference framework	An increase in surface area of 1%.
Target tendency	Increase
Additional information	According to the Statistical Yearbook, 2,742 ha were planted with vines in 2014, and in 2020 this area increased to 2,945 ha, which is an increase of 7.4%. If we look at the distribution of the total area under vineyards, i.e. vineyard plots by wine-growing subregions, we notice that as much as 96.33% of this area is located in the Podgorica subregion. Further analysis of the data collected for this indicator can provide useful insights on adaptation, for example: o Assessment of the impact of altitude on vineyard productivity and grape quality: comparing data from different altitudes can help understand how altitude affects vine growth, quantity and quality of grapes, including sugar, acidity and phenolic components that are crucial for wine quality. o Insights into the effectiveness of moving vineyards to higher altitudes as a strategy to mitigate the impacts of climate change: By analysing vineyard data at different altitudes, an assessment can be made whether moving vineyards to higher altitudes actually contributes to reduced risk arising from extreme temperatures, drought and other climate threats, and how this affects the long-term sustainability of wine production. This analysis can help make informed decisions and support development of strategies for winegrowers to adapt to changing climatic conditions.

Water sector indicators

Category	Description		
Name of the basic indicators for the agricultural sector. **Note: the tables below describe the indicator passports that need to be developed during the CCAP implementation.**	Number of analyses Number of trained individuals Number of plans, policies or strategies developed and adopted Number of implemented technological solutions	**Unit**	Number Number of persons Number Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** • **WOO 1.1. Ensure the up-to-date, high-resolution data as a basis for informed decision making** • **WSO 2.1. Build capacities for integration of climate risks into planning.**		
Short description	Activities include procurement and installation of meteorological and hydrological measuring stations, carrying out flood monitoring surveys, capacity building of data management and analysis experts, procurement of field equipment, strengthening of the cross-sectoral coordination mechanism between the water sector and spatial planning, and training of decision-makers and experts in climate change adaptation. Pilot activities on the Lim and Grnčar rivers are planned, including mapping and regeneration of waterland, and the development of studies for wider application. In addition, the plans include procurement and installation of software and hardware		

	solutions for relevant institutions, development of new methodologies for the protection of river basins, improvement of regulations on sanitary zones, and strengthening of the capacity of water supply companies for the implementation of new adaptation measures.		
Data type	Quantitative	**Data source**	CCAP Implementation Progress Reports
Responsible institution	Ministry of Ecology, Sustainable Development and Northern Development, NCSD		
Frequency of data collection	Monthly and annually	**Frequency of reporting**	Annually
Description of the methodology	The reporting methodology is based on the regular collection, analysis and presentation of data that reflect the progress of the implementation of activities and the achievement of objectives. Key steps include: Defining success indicators: clearly defining quantitative and qualitative indicators to monitor the impact of activities. Data collection: the use of surveys, interviews, field visits, administrative reports and technological tools such as satellite tracking and drones. Frequency of reporting: preparation of quarterly operational reports, annual comprehensive reviews and a final report on the results achieved. Data analysis: the use of descriptive and comparative analysis to evaluate progress against set goals. Transparency and communication: reports are delivered to relevant stakeholders, including farmers, decision-makers and funders, through meetings, workshops and digital platforms. Review and adjustment: based on the report findings, activities are adjusted to improve their effectiveness.		
Initial data (2023)	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are set at zero. This is done because relevant data are currently not available in the context of CCAP and in order to be able to measure the direct impact of the CCAP measures. Quantitative indicators: Number of analyses prepared with the aim of better understanding the consequences of climate change. Number of farmers/decision-makers trained in climate-smart practices in the water sector. Number of implemented technological solutions (e.g. measuring stations, GIS systems, etc). Number of plans, policies or strategies developed and adopted to support climate change adaptation. Qualitative indicators: Increased awareness and knowledge of beneficiaries/decision-makers about climate change and adaptation measures. Improved perception of beneficiaries/decision-makers about the sustainability of new practices.		
Medium-term reference framework 2025 - 2030	Quantitative indicators: 4 - Number of analyses prepared to better understand the impacts of climate change. 200 - Number of beneficiaries/decision-makers trained in climate-smart practices in the water sector. 12 measuring stations - Number of implemented technological solutions (e.g. measuring stations, GIS systems, etc.). 2 - Number of plans, policies or strategies developed and adopted to support climate change adaptation. Qualitative indicators: Increased awareness and knowledge of beneficiaries/decision-makers about climate change and adaptation measures. Improved perception of beneficiaries/decision-makers about the sustainability of new practices.		
Long-term reference framework	Quantitative indicators: 6 - Number of analyses prepared to better understand the consequences of climate change impacts. 300 - Number of beneficiaries/decision-makers trained in climate-smart practices in the water sector. 18 measuring stations - Number of implemented technological solutions (e.g. measuring stations, GIS systems, etc.). 4 - Number of plans, policies or strategies developed and adopted to support climate change adaptation.		

	Qualitative indicators: Increased awareness and knowledge of beneficiaries/decision-makers about climate change and adaptation measures. Improved perception of beneficiaries/decision-makers about the sustainability of new practices.
Target trend	Continuous increase
Additional information	

W1: % of the area covered by flood risk mapping compared the total land area.

Indicator name	% of the area covered by flood risk mapping compared the total land area.	**Unit**	Percentage (%)
Indicator category	Climate impact		
Goal	This indicator measures the cross-cutting objectives and measures of the CCAP, including**:** **Operational objective:**		
Short description	Flood risk maps identify areas based on their exposure and vulnerability to pluvial, river, and coastal flooding for varying levels of probability. They support decision-making regarding the development within and around these areas, and can also be integrated into contingency plans. Therefore, this indicator measures the percentage of the total territory for which a flood risk map has been developed. A possible limitation of this indicator is that the percentage of areas covered may not reflect the percentage of the population at risk. In addition, taking into account the different levels of risk between areas, a higher percentage of covered areas may hide the fact that some high-risk areas are not included. This indicator could be complemented by other indicators to assess the quality of the maps, their application and the results achieved by their use.		
Data type	Quantitative	**Data source**	Water Authority
Responsible institution	Water Authority		
Frequency of data collection	The data should be updated on an annual basis.	**Frequency of reporting**	Annually
Description of the methodology	The following methodological approach has been developed to be consistent with the current definitions and approach from the National Flood Protection and Rescue Plan. These steps should be taken on an annual basis to collect the data for this indicator: **1. Collect flood risk maps from the Water Administration.** 2. **Calculate the total area** currently covered (in km²), taking into account that the areas that can be covered by several flood risk maps are not counted. 3. **Calculate the percentage of the territory covered** by dividing the total area covered by the total area of the territory of Montenegro, which is 13,812 km² (MONSTAT, 2010). The result must be multiplied by 100 to get the percentage. • Calculation formula:		

	Coverage Percentage =x100$\left(\frac{Total\ surface\ area\ covered\ by\ flood\ risk\ maps}{13.812}\right)$
Initial data	*TBC*
Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	100%
Target trend	Increasing
Additional information	Flood risk mapping should take into account transboundary river basins.

W2: Number of people living in flood-prone areas, by gender.

Category	Description		
Indicator name	Number of people living in flood-prone areas, by gender	**Unit**	Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** o WOO 1.2. Ensure coordinated intersectoral water management **Adaptation measures:** • W1.1.2. Upgrading and using existing flood risk mapping to develop interventions that prioritize Natural Water Retention measures.		
Short description	The indicator measures the total number of inhabitants living in flood-prone areas, broken down by gender. For the purposes of this indicator, "floods" include pluvial (associated with precipitation), fluvial (associated with rivers) and coastal floods, all of which affect Montenegro. High number of people living in flood-prone areas indicates high exposure to flood risk. This indicator provides insight into the demographic distribution of flood risks and changes over time. Disaggregating data by gender makes it possible to identify specific gender vulnerabilities and needs, ensuring that disaster preparedness and response plans are adaptable and inclusive. The data collected by this indicator will support flood risk management planning, policy-making and, consequently, resource allocation by the Ministry of Interior, the Environmental Protection Agency, the Ministry of Health and other relevant stakeholders. Although the indicator is comprehensive, the accuracy of flood risk maps can vary, affecting the accuracy of population estimates. Also, collecting gender-disaggregated data can be challenging. Currently, the indicator does not take into account other social and economic factors such as age, disability and income, which would allow for a more comprehensive identification of vulnerable populations.		
Data type	Quantitative	**Data source**	National Flood Protection and Rescue Plan
Responsible institution	Ministry of Interior, Environmental Protection Agency, Ministry of Health, MONSTAT and other relevant data sources.		
Frequency of data collection	Annually	**Frequency of reporting**	Annually

Description of the methodology	For alignment with the current definitions and approach from the National Flood Protection and Rescue Plan, the following steps should be taken annually: 1. **Define risk of flooding** • Determine flood risk according to different types of floods (fluvial, pluvial and coastal). • It is recommended to use criteria such as floods that occur once every 200 years to take into account the varying frequency and intensity of floods due to climate change. 2. **Collect flood risk maps** • Obtain flood risk maps from the Water Administration. 3. **Collect population data** • Collect population data from the most recent MONSTAT census, including demographic data by gender. 4. **Visualize flood risk areas** • Use GIS software to overlay flood risk data with population data to visualize risk areas. 5. **Calculate the number of inhabitants in flood risk areas** • Calculate the number of inhabitants per km² for each region. • Multiply the number of inhabitants per km² by the number of km² of the region that is in flood-prone areas. 6. **Calculate the national value** • Combine the results for all regions to obtain an overall national value. 7. **Sort data by gender** • Separate the population of flood-prone areas into male and female populations. *If available resources and capacities allow, it is recommended to categorize population in flood-prone areas by other factors, such as: age, income, disability and ethnicity. This would allow for a more comprehensive understanding of the demographic composition of the population in risk areas and how this composition is changing.*
Initial data	*TBC*
Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	*TBC*
Target trend	Decreasing
Additional information	This indicator can be complemented by other indicators to assess the social and economic impacts of floods on people living in flood-prone areas.

W3: Losses due to flooding on an annual basis: i) financial losses (€). ii) Number of deaths.

Category	Description		
Indicator name	Losses due to flooding on an annual basis: i) Financial losses (€); ii) Number of deaths.	**Unit**	i. Euro ii. Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** **AOO 3.1. Ensure minimal losses of yields through implementation of adequate technical measures**		

	Adaptation measures: **W1.1.2.** Upgrading and using existing flood risk mapping to develop interventions that prioritize Natural Water Retention measures. **H1.1.3.** Introduce an early warning system to prepare the health sector for appropriate response during the weather extremes, supported by training programs to enhance knowledge and skills of the workforce in the health care facilities. **T3.1.1.** Upgrade early warning systems for tourism business and users and implement awareness program.		
Short description	This indicator measures the overall financial impact of flood events that occurred during the year. This includes direct financial losses, such as damage to infrastructure, property, businesses, farmland and yields, tourism, as well as indirect costs such as lost productivity/income and increased healthcare costs. This indicator allows the Government of Montenegro to understand the financial losses caused by floods and the economic burden on communities, businesses and the state. The collection of these data provides support in allocating resources for flood preparation, mitigation, and recovery, as well as for resilience planning, strategy, and insurance purposes. Estimates of financial losses are possible if there is a large number of unsecured assets or for informal work/assets (e.g. in the tourism sector). Indirect losses, such as long-term health effects or reduced asset value, are difficult to quantify and can lead to inaccuracies. *In the future, this indicator will include an additional element: number of deaths, the collection of which is recommended as soon as possible. These data are crucial for measuring flood-related deaths and assessing the speed and efficiency of the health system in responding to floods.*		
Data type	Quantitative	**Data source**	Ministry of Finance Institute for Hydrometeorology and Seismology
Responsible institution	Ministry of Ecology, Sustainable Development and Northern Region Development based on information available from institutions (Ministry of Interior (Directorate for Protection and Rescue), Ministry of Health, and other relevant data sources.		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	The methodological approach to measuring this indicator includes the following steps to be taken on an annual basis: 1. **Identify data sources**: these include the Ministry of Finance, the Ministry of Agriculture, Forestry and Water Management, the Ministry of Health, the Ministry of Tourism, the Ministry of Ecology, Sustainable Development and Northern Region Development, the Union of Municipalities and insurance companies. 2. **Collect data about direct losses**: Request data from data sources on direct financial losses due to floods (e.g. Health: damage to hospitals, Tourism: damage to cultural monuments, Water: damage to water treatment plants, Agriculture: losses in livestock farming). 3. **Collect data about indirect losses**: Request data from data sources on indirect losses due to floods (e.g. Health: costs of flood-related diseases, Tourism: cancellation of hotel reservations, Water: cost of water supply interruptions, Agriculture: increase in food prices). 4. **Apply value calculation for each sector (including direct and indirect losses):** For example: • Losses in agriculture = Value of loss in crops + Value of loss in livestock + Cost of repairing infrastructure + Loss of income. 5. **Sum up the total financial losses due to floods**: Add the financial losses of all sectors for the previous year to get the total loss due to floods. If available resources and capacities are available, it is recommended to disaggregate the data by: (i) the type of flood (pluvial, fluvial, coastal), (ii) the municipality, and (iii) the sector.		
Baseline data	*TBC*		
Medium-Term Reference Framework (TBD)	*TBC*		
Long-term reference framework (TBD)	*TBC*		
Target tendency	Decreasing		

Additional information	The methodology of this indicator should be updated in accordance with the adoption of the Law on Reconstruction after Natural Disasters and Technical-Technological and Other Disasters.

Health sector indicators

Category	Description		
Name of the basic indicators for the agricultural sector. **Note: the tables below describe the indicator passports that need to be developed during the CCAP implementation.**	Number of analyses. Number of protocols, plans/programmes, policies or strategies developed and adopted. Number of institutions identified and involved. Number of plans evaluated. The number of SOPs developed at the national and local level. The number of health care professionals trained based on SOPs. Number of early warning systems analyzed.	**Unit**	Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** • **HOO 1.1 Enhance preparedness of the sector to climate change through development of processes and systems.** • **HOO 3.1 Implement public preparedness and awareness campaigns and measures.**		
Short description	For effective climate risk management in the health sector, a climate risk assessment is necessary to identify the impacts of climate change on infrastructure and capacities of health services. Key steps include updating emergency protocols and guidelines, developing action plans to adapt systems and infrastructure, and positioning key stakeholders within the health sector. The collection of epidemiological data and the analysis of environmental factors make identification of gaps in existing preparedness plans possible. Cooperation with stakeholders, development of standard operating procedures, and definition of the roles and responsibilities of the sector are also		

	necessary steps. Early warning system assessment, stakeholder integration, analysis of existing measures and population awareness raising through KAP research are key to resilience to extreme weather conditions.		
Data type	Quantitative	**Data source**	CCAP Implementation Progress Reports
Responsible institution	Ministry of Ecology, Sustainable Development and Northern Region Development, NCSD		
Frequency of data collection	Monthly and annually	**Frequency of reporting**	Annually
Description of the methodology	Methods for collecting information for indicators: Document analysis: An overview of existing preparedness plans, protocols and guidelines. Research and assessment: Conduct epidemiological research and environmental analyses related to climate change. Interviews and focus groups: Consultations with key stakeholders, including institutions and organizations from the health, environmental and emergency sectors. KAP surveys: Examine the knowledge, attitudes and practices of the population regarding extreme weather conditions. Capacity assessment: Analyse the technical and human resources of health institutions and existing early warning systems. Cooperation and coordination: Organize workshops with stakeholders to define common platforms and action plans.		
Initial data (2024)	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are set at zero. This is done because relevant data are currently not available in the context of CCAP and in order to be able to measure the direct impact of the CCAP measures. Number of analyses. Number of protocols, plans/programmes, policies or strategies developed and adopted. Number of institutions identified and involved. Number of plans evaluated. Number of SOPs developed at the national and local level. Number of health care professionals trained based on SOPs. Number of early warning systems analysed		
Medium-term reference framework for the period 2025-2030	2 - Number of analyses. 2 - Number of protocols, plans/programmes, policies or strategies developed and adopted. 5 - Number of institutions identified and involved. 5 - Number of plans evaluated 2 - The number of SOPs developed at the national and local level. 50 - Number of health care professional trained based on SOPs. 1 - Number of early warning systems analysed.		
Long-term reference framework	2 - Number of analyses 3 - Number of protocols, plans/programmes, policies or strategies developed and adopted 10 - Number of institutions identified and involved. 10 - Number of plans evaluated. 5 - Number of SOPs developed at the national and local level. 100 - Number of health care professionals trained based on SOPs. 1 - Number of early warning systems analysed.		
Target trend	Continuous increase		
Additional information			

H1: Number of cases of vector-borne and waterborne diseases per 100.000 people.

Category	Description

Indicator name	Number of cases of vector-borne and waterborne diseases per 100.000 people.	**Unit**	Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** o HOO 3.1 Implement public preparedness and awareness campaigns and measures **Adaptation measure:** • H2.1.1 Strengthen the capacity of researchers working on infectious diseases by incorporating an intersectional gender approach • CC1.1.1 Create robust procedures for data collection, monitoring and reporting across sectors, with a data management database to ensure availability of data for planning, policy and programming		
Short description	The indicator measures the incidence of diseases caused by vectors (such as mosquitoes, ticks and flies) and contaminated water sources. The World Health Organization (WHO)[34] predicts that climate change will result in an increase in vector-borne diseases (VBDs) and waterborne diseases (WBDs), by creating more favourable conditions for vectors in terms of temperature and precipitation, leading to an expansion of geographical distribution and deterioration in water quality and, consequently, to waterborne diseases. This indicator is crucial for monitoring public health and changes in the outbreak of VBD and WBD, and thus for monitoring the impact of climate change on the environment and human health. The indicator depends on the quality of reporting within the health system in order to accurately determine cases of VBD and WBD. Also, some cases of diseases may not be reported if people do not seek medical attention.		
Data type			
Quantitative	**Data source**	Health Care institutions	
Responsible institution	Institute for Public Health		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	These steps should be carried out annually in order to collect data for this indicator: **1. identify diseases for data collection:** Vector-borne diseases[35,36]: Leishmaniasis, Babesiosis, Malaria, Dirofilariasis, Lyme borreliosis, West Nile fever. Waterborne diseases: Salmonellosis and diarrheal diseases. *These diseases are currently the most relevant for Montenegro in the context of short-term climate change. In the future, as the distribution of each disease changes, this list should be reviewed and expanded as necessary.* 2. **Collect data from data sources** (including healthcare institutions such as hospitals, clinics, health centres, and laboratories) using standardized reporting forms that include patient demographics, such as age, gender, and location. 3. **Collect data in a centralized database** and clean it in order to remove duplicate information and correct any errors. 4. **Calculate the number of cases per 100,000 inhabitants** by dividing the total number of cases by the population of Montenegro and multiplying the results by 100,000. 5. **Classify findings** according to:		

[34] WHO. 2024. Climate Change. Available at: https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health
[35] WHO Europe. In 2014, the Black Gra on World Health Day indicates the growing threat of vector-borne diseases. Available at: https://who-sandbox.squiz.cloud/en/countries/montenegro/news/news/2014/06/montenegro-points-to-increasing-threat-of-vector-borne-diseases-on-world-health-day
[36] Dakić Z, Čakić S, Kulišić Z, Poluga J, Pavlović M, Lavadinović L, Pelemiš M. Human Vector-Borne Transmissible Parasitic Diseases in Montenegro. In: Current Topics in Parasitology. IntechOpen; 2015. DOI: 10.5772/61534

	(i) municipality, (ii) type of disease, (a) age group, (a) field, (c) ethnicity.
Initial data	*TBC*
Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	*TBC*
Target trend	Decreasing
Additional information	

H2: Number of hospital beds located in flood risk areas.

Category	Description		
Indicator name	Number of hospital beds located in flood risk areas.	**Unit**	Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** o WOO 2.3. Mainstream nature-based solutions to reduce climate risk **Adaptation measures:** • W1.1.2. Upgrading and using existing flood risk mapping to develop interventions that prioritize Natural Water Retention measures. • H1.1.3 Introduce an early warning system to prepare the health sector for appropriate response during the weather extremes, supported by training programs to enhance knowledge and skills of the workforce in the health care facilities.		
Short description	This indicator measures the exposure of healthcare institutions to flood risks, which helps to understand the potential impact of floods on health infrastructure and services. Continuous monitoring of this indicator supports the continuity of health services, enabling their provision even during floods. The indicator includes hospitals at risk of rain (pluvial), river (fluvial) and coastal flooding. By identifying the number of beds, the indicator provides a detailed and applicable understanding of the capacity and preparedness of the health system in flood-prone areas, which supports strategic health care planning.		
Data type	Quantitative	**Data source**	Directorate for Protection and Rescue Hospitals Water Administration

Responsible institution	Ministry of Health Directorate for Protection and Rescue (Ministry of Interior)		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	These steps should be carried out annually in order to collect data for this indicator: **1. Obtain flood risk maps** from the Water Administration, which identify zones of low, medium and high flood risk. **2. Identify hospitals** (public and private) located in medium (1% AEP) and high (3.3% AEP) flood risk zones using data from the Directorate for Protection and Rescue. **3. Collect bed capacity data** for each hospital located in flood risk zones, including the total number of hospitalization beds from each hospital. **4. Calculate the total number of beds** in medium and high flood risk zones for reporting purposes, by adding and combining the number of hospital beds in each flood risk category. **5. Sort the data** according to the number of beds in each municipality.		
Initial data	*TBC*		
Medium-Term Reference Framework (TBD)	*TBC*		
Long-term reference framework (TBD)	*TBC*		
Target tendency	Decreasing		
Additional information			

H3: Education, awareness-raising, guidance and support for protection from high temperatures according to the scorecard.

Category	Description		
Indicator name	Education, awareness-raising, guidance and support for protection from high temperatures according to the scorecard.	**Unit**	Result
Indicator category	Adaptation activity		
Goal	**Operational objectives:** o HOO 1.1 Enhance preparedness of the sector to climate change through development of processes and systems. • HOO 3.1 Implement public preparedness and awareness campaigns and measures. **Adaptation measure:**		

	• H3.1.1 Development and promotion of education, awareness raising and general guidelines and support of facilities for the population during heat waves and extremes and other negative consequences caused by climate change.		
Short description	Climate change increases the frequency, intensity and duration of heatwaves globally, which can also be observed in Montenegro. High temperatures pose significant health risks, including heat exhaustion, heatstroke, and worsening pre-existing health conditions. Effective education and awareness-raising programs, comprehensive guidance, and strong support systems are key to building adaptation capacity, mitigating these risks, and protecting public health. This indicator measures how well these elements have been implemented and maintained, which is essential for strengthening the resilience of communities to the adverse effects of climate change. The approach to monitoring and measuring preparedness for heatwaves and high temperatures uses **a** scorecard to assess multidimensional preparedness at different levels of society, sectors and communities, providing a strong indicator of Montenegro's capacity to cope with extreme heat. In the future, this indicator should be complemented with an outcome indicator to assess effectiveness in changing behaviour or reducing heat-related health impacts, as the current indicator only measures the existence of materials and programs, not their effectiveness.		
Data type	Quantitative	**Data source**	Ministry of Health Institute for Public Health
Responsible institution	Ministry of Health and Institute for Public Health		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	These steps should be carried out on an annual basis in order to collect data for this indicator: 1. **Form a working group** composed of relevant stakeholders who have access to the data relevant for this indicator. 2. **Data collection** should be carried out using the following approaches: • **Surveys and questionnaires**: use them to collect data from municipalities, educational institutions and the public. • **Document review**: analyse existing guidelines, educational materials, and records of awareness-raising campaigns and support systems. • **Interviews**: interviews with relevant key stakeholders, such as health professionals, educators and community leaders, to validate the findings. 3. **Rate each category of the scorecard** on a scale of 1 to 5, where 5 indicates comprehensive and highly effective measures to combat extreme heat and 1 lack of measures. Categories include: (i) educational programs, (ii) awareness-raising campaigns, (iii) guidelines, iv) support systems. 4. **Calculate the overall score** by adding up the scores from each category (see the attached scoreboard in Appendix 1 for details): • **High score (16-20):** Indicates a robust system with comprehensive education, awareness campaigns, guidance and support to protect against high temperatures. • **Medium score (11-15):** indicates a relatively effective system, but with areas that need improvement. • **Low score (6-10):** indicates a system with significant deficiencies in education, awareness, guidance, and support for high temperatures. • **Very low score (1-5):** indicates a lack of adequate measures to protect against high temperatures. 5. **Ensure objectivity in evaluation**: Due to subjectivity in evaluation, formation of a working group is recommended every year to conduct evaluation and reduce possible biases as much as possible.		
Initial data	*TBC*		

Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	*TBC*
Target trend	Increasing
Additional information	The table of results can be found in Appendix 1.

Annex1: Table to measure indicator H3

	Score definitions				
Category	**5**	**4**	**3**	**2**	**1**
Educational programs	Comprehensive and inclusive programs available in all schools and communities, regularly updated, with a high degree of participation.	Programs available in most schools and communities, regularly updated.	Programs available, but not widely disseminated or updated.	Limited programs, which are not updated regularly.	Programs are not available.
Awareness campaigns	Frequent and widespread campaigns through various media, with significant public involvement.	Regular campaigns with good coverage and moderate public involvement.	Occasional campaigns with moderate coverage.	Rare campaigns with limited coverage.	Campaigns aren't available.
Guidelines	Comprehensive, accessible and regularly updated guidelines in multiple languages.	Comprehensive guidelines that are updated periodically.	Guidance available, but not comprehensive or regularly updated.	Limited guidance available.	Guidance is not available.
Support Systems	Multiple support systems available and easily accessible for all populations, including vulnerable groups.	Good support systems available to the majority of the population.	Support systems are available, but they are not widely available.	Limited support systems are available.	Support systems are not available.

H4: Number of health institutions implementing disaster preparedness and climate resilience measures.

Category	**Description**		
Indicator name	Number of health institutions implementing disaster preparedness and climate resilience measures.	**Unit**	Result
Indicator category	Result of adaptation		

Objectives	**Operational objectives:** • **HOO 1.1** Enhance preparedness of the sector to climate change through development of processes and systems. **Adaptation measures:** • **H 1.1.1:** Improve the preparedness of staff, facilities and systems in the health sector for climate hazards, through training, climate risk assessments and specific interventions. • **H 1.1.2:** Include and define health sector's role in hazard preparedness and response in the national and local level readiness plans. • **H 3.1.1:** Development and promotion of education, awareness raising and general guidelines and support of facilities for the population during heat waves and extremes.		
Short description	The health sector in Montenegro is currently not fully equipped to face the growing challenges posed by climate change. This indicator measures how well hospitals in Montenegro implement disaster and climate resilience preparation measures, and assesses the health sector's level of preparedness for disaster risks and climate change. The indicator consists of an assessment at the national level, to assess trends over time, and at the municipal level, for comparison between regions. These measures can be categorized into three main types and include (but are not limited to): **1. Risk identification and monitoring** o Conduct disaster and/or climate change risk assessments for individual institutions (e.g. for hospitals). o Conduct disaster and/or climate change risk assessments at the community level. **2. Build resilience to service disruptions** o Implement specific protocols, guidelines, and contingency plans, such as the *Heat Wave Response Plan*. o Comply with appropriate building codes that take into account climate change and disasters to ensure climate resilience and environmental sustainability (e.g. installation of data centers and electrical systems outside basements to reduce the risk of service interruptions during flooding). **3. Capacity building of health care workers** o Implement targeted training programs to train healthcare professionals to understand climate hazards. o Train health professionals to recognize the signs, symptoms, and treatment of vector-borne diseases associated with changes in precipitation and temperature patterns. A possible limitation of this indicator is that, although it is comprehensive, it does not assess the quality, adequacy and relevance of disaster preparedness and resilience measures undertaken by health institutions. The indicator is currently focused on hospitals, but in the future, it should be expanded to other types of healthcare institutions such as emergency centers, nursing homes, birth centers, health clinics and laboratories.		
Data type	Quantitative	**Data source**	Institute for Public Health
Responsible institution	Institute for Public Health		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	These steps should be carried out annually to collect data for this indicator: 1. **Form a working group** o Bring together a working group of relevant stakeholders who have access to data related to the indicator. 2. **Use various data collection methods**, including: o Surveys and questionnaires distributed to hospitals to gather information on existing measures to prepare for climate change and disaster resilience. o Review of documents, such as hospital guidelines and records of climate change and resilience preparedness measures. o Interviews with key stakeholders, such as hospital managers or administrators, and, where available, resilience teams.		

	3. Rate each health institution o Rate each health institution on a scale of 1 to 3: - **3** stands for comprehensive and highly effective preparedness measures for resilience to climate change and disasters. - **1** indicates lack of measures. (See the rating form in Appendix 1). **4. Calculate points by municipality** o The sum of all ratings for hospitals in a municipality is divided by the number of hospitals in that municipality. **5. Calculate the national average** o The sum of the ratings by municipalities is divided by the number of municipalities that have hospitals. The nature of rating can lead to some subjectivity. Formation of a working group is recommended each year to carry out the rating, with the support of an audit group with different evaluators to verify the results of the working group. Evidence-based rating should be applied, which implies that rates are supported by evidence attached to the rating form. This ensures that the evaluation is based on facts and not perceptions.
Initial data (2024)	*TBC*
Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	100%
Target trend	Increasing
Additional information	The table of results can be found in Appendix 1.

Annex 1: Table with results for indicator H4 measures

	Definition of rates				
Category		**1**	**2**	**3**	**Result**
Risk identification and monitoring	Asset-based disaster and climate change risk assessments. *Conducting risk assessments for healthcare institutions (e.g. hospitals)*	No	Ongoing/Partial Assessments	Complete	
	Disaster and climate change risk assessments based on community needs. *Assessing the risks to the community.*	No	Ongoing/Partial assessments	Complete	

Building resilience to service disruptions	Contingency protocols, guidelines and plans *Relevant plans and guidelines for areas, such as the Heatwave Response Plan, the Flood Response Plan, the Pandemic Response Plan, etc.*	Not developed	Planned or partial/incomplete plans (including lack of plans for relevant hazards in the area).	Fully implemented, including response plans and guidance for all relevant hazards.	
	Compliance with building codes *Ensuring that building codes take into account climate change and disaster risks (e.g., avoiding the installation of critical systems in basements).*	Not compliant	Partially compliant	Fully compliant	
	Resilience of infrastructure and equipment *Key equipment, such as backup power generators and a resilient water supply and sanitation systems.*	No resilient infrastructure or equipment, or no registered infrastructure/ equipment.	Resilient infrastructure and equipment partially present, but missing or outdated/ non-compliant.	Resilient infrastructure and equipment systems are in place, fully updated, and compliant with regulations.	
Capacity Building/Training	Training on climate hazards *Train healthcare professionals to understand and respond to climate hazards, including vector-borne diseases.*	No training	Partially implemented training (e.g. for a limited number of employees, or conducted for different groups of employees, but insufficient on key topics).	A complete package of training conducted consistently and regularly for healthcare professionals.	
	Overall result:				

H5: No. of municipal plans for heat waves.

Category	Description		
Indicator name	No. of municipal plans for heat waves	**Unit**	Number
Indicator category	Result of adaptation		
Objectives	This indicator measures the objectives and measures that intersect within the CCAP, including: **Operational objectives:** o **HOO1.1:** Enhance preparedness of the sector to climate change through development of processes and systems **Adaptation measures:** o **H1.1.1:** Improve the preparedness of staff, facilities and systems in the health sector for climate hazards, through training, climate risk assessments and specific interventions. o **H1.1.3:** Introduce an early warning system to prepare the health sector for appropriate response during the weather extremes, supported by training programs to enhance knowledge and skills of the workforce in the health care facilities o **H3.1.1:** Development and promotion of education, awareness raising and general guidelines and support of facilities for the population during heat waves and extremes.		
Short description	Plans for heatwaves are becoming increasingly important in the country and on the continent, which will be exposed to increasingly severe and frequent extreme heat. Municipal-level heatwave plans can help reduce the number of deaths from extreme heat and support those most vulnerable to the effects of heatwaves. This indicator counts the number of municipalities in Montenegro that have plans to manage the impact of extreme heat and heat waves. This indicator will help determine how prepared municipalities are for events related to heat waves. Currently, plans for heat waves at the municipal level are not legally required in Montenegro, but they are recommended. The existence of heatwave plans usually suggests increased resistance to extreme heat events. However, this indicator does not measure the quality, necessity, or effectiveness of these plans. Therefore, the number of plans is not expected to be directly related to vulnerability to heatwaves. For example, vulnerability to heatwaves may be greater in a municipality with a heatwave plan than in one that does not have a formal plan. Also, developing a heatwave plan in a municipality at a higher altitude may be less effective than improving an existing plan in a municipality that is more likely to be exposed to this hazard.		
Data type	Quantitative	**Data source**	Union of Municipalities
Responsible institution	Union of Municipalities		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	**Data must be collected from each municipality in Montenegro to understand the level of coverage with heatwave plans.** Each municipality should provide information on whether it has a specific heatwave plan or another plan related to extreme heat (for example, an Energy and Climate Action Plan that explicitly treats extreme heat). The following steps should be taken: 1. **Map municipalities across Montenegro and establishing contact** with everyone to prepare them for data collection. 2. **Request and record all municipal heatwave plans** or progress regarding heatwave plans (or any other plan related to extreme heat management). 3. **Analyse the plans and categorize them into the following groups:**		

	a. **Current:** Any plan that has been published or updated in the last 5 years and that is considered active. b. **Obsolete:** Any outdated plan that is no longer considered valid and is more than 5 years old. c. **Pending:** any plan that is currently being developed but has not yet been published. 4. **Update the findings annually** to monitor progress toward achieving full coverage with municipal heatwave plans. 5. **Report the total number of current heatwave plans** along with those that are potentially obsolete or pending. 6. **Analyse the data** by dividing **the current, outdated** and **pending plans** with the total number of municipalities in Montenegro, excluding those for which data are not available. This will provide a good insight into the number of municipalities that have current plans, those that have potentially outdated plans, those that have pending plans, and those that have none of the above options.
Initial data (2024)	*TBC*
Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	25 (all)
Target tendency	Increasing
Additional information	Heatwave plans can be prepared faster and can be more effective if they are based on similar rules applied by municipalities that are either close to or already have particularly good heatwave plans.

Tourism sector indicators

Category	Description		
Name of the basic indicators for the agricultural sector. **Note: the tables below describe the indicator passports that need to be developed during the CCAP implementation.**	Number of analyses Number of trained persons Number of financial schemes Number of policies or strategies developed and adopted	**Unit**	Number Number Number
Indicator category	Climate impact		
Objectives	**Operational objectives:** • **TOO 1.1 Implementation of a diverse tourism offer to enhance resilience of the sector.** • **TOO 1.2 Identify and develop funding opportunities to enhance transformation of the sector.** • **OCT 3.1 Improve coordination between climate services (Climate services should provide relevant and timely information on climate risks and impacts to the tourism sector. This includes long-term climate change forecasts as well as short-term forecasts of extreme weather events) and the tourism sector to strengthen preparedness.**		
Short description	The development of climate-resilient tourism includes preparation of strategies, guidelines and education programs for capacity building, promotion of sustainable practices, risk assessment and adaptation of the tourism offer. The focus is on vulnerable communities, development of less sensitive activities such as ecotourism, establishment of financial programs and international cooperation. The plan is to integrate early warning systems, crisis management and continuous research to ensure the resilience of the sector and sustainable development.		
Data type	Quantitative	**Data source**	CCAP Implementation Progress Reports
Responsible institution	Ministry of Tourism, Ministry of Ecology, Sustainable Development and Northern Development, NSOR		
Frequency of data collection	Monthly and annually	**Frequency of reporting**	Annually
Description of the methodology	The reporting methodology is based on the regular collection, analysis and presentation of data that reflect the progress of the implementation of activities and the achievement of objectives. Key steps include: Definition of success indicators: to define quantitative and qualitative indicators clearly to monitor the impact of activities. Data collection: to use surveys, interviews, field visits, administrative reports and technological tools such as satellite tracking and drones. Frequency of reporting: to prepare quarterly operational reports, annual comprehensive reviews and a final report on the results achieved. Data analysis: to use descriptive and comparative analysis to evaluate progress against set goals. Transparency and communication: to provide reports to relevant stakeholders, including farmers, decision-makers and funders, in meetings, workshops and through digital platforms. Audit and adjustment: based on the findings of the report, to adjust activities to improve their effectiveness.		
Baseline data (2024)	Taking into account the specific nature of the measures, their focus on preventing the negative impacts of climate change, as well as the fact that the CCAP has been prepared for the first time, the baseline indicator values are set at zero. This is done because relevant data are currently not available in the context of CCAP and in order to be able to measure the direct impact of the CCAP measures. Quantitative indicators: Number of analyses prepared with the aim of better understanding the consequences of climate change. Number of beneficiaries/decision-makers trained on climate-smart practices. Number of financial incentives created and implemented for service providers.		

	Number of policies or strategies designed and adopted to support climate change adaptation. Qualitative indicators: Increased awareness and knowledge of service providers on climate change and adaptation measures. Improved perception of service providers about the sustainability of new practices. Identified and reduced barriers to the implementation of climate-smart measures. Increased customer satisfaction with financial and technical support programs.
Medium-term reference framework 2025 - 2030	Quantitative indicators: 5 - Number of analyses prepared with the aim of better understanding the consequences of climate change. 200 - Number of beneficiaries/decision-makers trained on climate-smart practices. 2 - Number of financial incentives created and implemented for service providers. 1 – Number of policies or strategies designed and adopted to support climate change adaptation. Qualitative indicators: Increased awareness and knowledge of service providers on climate change and adaptation measures. Improved perception of service providers about the sustainability of new practices. Identified and reduced barriers to the implementation of climate-smart measures. Increased customer satisfaction with financial and technical support programs.
Long-term reference framework	Quantitative indicators: 8 - Number of analyses prepared with the aim of better understanding the consequences of climate change. 500 - Number of beneficiaries/decision-makers trained on climate-smart practices. 4 – Number of financial incentives created and implemented for service providers. 1 - The number of policies or strategies developed and adopted to support adaptation to climate change. Qualitative indicators: Increased awareness and knowledge of service providers on climate change and adaptation measures. Improved perception of service providers about the sustainability of new practices. Identified and reduced barriers to the implementation of climate-smart measures. Increased customer satisfaction with financial and technical support programs.
Target trend	Continuous increase
Additional information	

T.1: Number of tourists and number of overnight stays per tourist.

Category	Description		
Indicator name	Number of tourists and number of overnight stays per tourist.	**Unit**	Number and number of overnight stays
Indicator category	Climate impact		
Objectives	**Operational objective:** o **TOO 1.1** Implementation of a diverse tourism offer to enhance resilience of the sector. o **TOO 2.1** TOO 2.1 Improve knowledge base to implement technical measures.		

	Adaptation measures: • All measures in tourism.		
Short description	The number of tourists coming to Montenegro provides key information that will inform tourism policy and strategy, as well as the development of tourism in Montenegro. As climate change affects seasonal changes, extreme weather conditions and temperatures, Montenegro may experience changes in the seasonality of foreign and domestic tourists. For example, extreme temperatures in summer can lead to a higher number of visitors during the transitional seasons. Looking at the average number of overnight stays per tourist provides information on changes in tourist habits and gives insight into the sustainability of tourism. For example, fewer tourists staying longer are often considered more sustainable due to reduced transport emissions, less resource consumption, reduced excessive crowding, and deeper engagement with Montenegrin people, culture, and activities. The indicator includes specific categories of accommodation: • Collective accommodation: covers all collective accommodation facilities that provide accommodation services under the Tourism Act. • Individual accommodation: covers accommodation facilities that provide services in households (individual tourist accommodation or "private accommodation"), which, according to the Tourism Act, include accommodation units with a maximum of 15 beds and are owned by individuals.		
Data type	Quantitative	**Data source**	Statistical Administration - MONSTAT
Responsible institution	Statistical Administration - MONSTAT		
Frequency of data collection	Monthly	**Frequency of reporting**	Annually
Description of the methodology	*MONSTAT's methodology* *Methodology for collecting and processing data on tourist arrivals and the number of overnight stays:* 1. **Define the scope of data collection:** • Collective accommodation: includes all types of hotels, resorts, guesthouses, motels, tourist centres, hostels, etc. • Individual/private accommodation 2. **Collect data on tourist turnover (number of tourists and number of overnight stays) in collective accommodation:** • Source of data: records form the guest books kept by the reception desks of collective accommodation facilities. • Accommodation facilities covered: all types of hotels, resorts, guesthouses, motels, tourist complexes, hostels, etc. 3. **Collect data on tourist turnover in individual/private accommodation:** • Data source: o Administrative databases o Local tourism organization o Ministry of interior o Ministry of Tourism o National Tourism Organization o Secretariats of local self-governments o Register of residence (database RB90) under the jurisdiction of the Ministry of Interior, governed by the Law on Foreigners. o Statistical sources and records 4. **Analyse data** • **Data collection on a monthly basis:** o The data should be collected monthly and displayed by the number of tourists:		

	• by month • by season • by year o The data should be segregated by: • sex • nationality • age • type of accommodation • municipality 5. **Review and update:** • Periodically review methodology and update data collection practices based on findings and recommendations from previous analyses. • Regularly evaluate and update the methodology to address any gaps or issues in the data collection and analysis process. Tourism statistics: https://monstat.org/eng/page.php?id=44&pageid=44
Baseline data (2023)	• 2,613,306 arrivals • 16,389,279 overnight stays https://monstat.org/eng/page.php?id=1454&pageid=1454 https://monstat.org/eng/page.php?id=1458&pageid=1458
Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	*TBC*
Target trend	*TBC*
Additional information	Data on individual accommodation by municipalities and on a monthly level for 2017 and 2018 are not fully comparable with data from previous years due to changes in the methodology.

T.2: Annual change in the number of ski days.

Category	Description		
The name of the indicator	Annual change in the number of ski days.	**Unit**	Percentage (%)
Indicator category	Climate impact		
Objectives	**Operational objective:** o **TOO 2.2** Use data to support policy initiatives to provide enabling environment for diversification. **PKP measures:** • All measures in tourism.		
Short description	Ski resorts across Europe and many other parts of the world are facing a high risk of reduced skiing capacity due to milder winters. To reduce exposure to snowfall reduction, ski resorts have increased investment in the development of alternative activities that can be on offer even with reduced snowfall. Hiking,		

	cycling and rafting are already popular and can be further developed. Also, investments in technologies such as artificial snow generators can slow the decline in the number of ski days. This indicator tracks the number of ski days in Montenegro each year. The number of ski days will be determined based on ski centres throughout Montenegro, and will include the following factors: • Snow depth threshold: minimum 30 cm of snow on the ground for ski tourism. • Snow reliability: sufficient snow cover (30 cm+) for at least 100 days. • Operational services: Elevators and facilities must be functional and operational. • Trail availability: a significant portion of trails must be open (e.g., 70%+). An increase in the number of ski days indicates a good amount and quality of snow. However, the amount of snow in Montenegro is decreasing due to milder winters. Some regions are at higher risk of reduced snowfall and number of ski days, which is why a breakdown by region and altitude will help identify regions or types of ski resorts that are at higher risk. This indicator will help inform decisions on the measures to be taken to build social and economic resilience in areas that have historically relied on the ski industry. This indicator does not take into account the increased use of artificial snow, and therefore may indicate an increase in the number of ski days despite a decrease in precipitation. Also, the indicator does not take into account changes in tastes and interests, as skiing may become more popular despite reduced snowfall, and the number of ski days may increase.		
Data type	Quantitative	**Data source**	Ski resorts of Montenegro and the National Tourism Organization
Responsible institution	Ski resorts of Montenegro and the National Tourism Organization		
Frequency of data collection	Annually	**Frequency of reporting**	Annually
Description of the methodology	The approach to monitoring and reporting about this indicator includes the following steps: 1. **Map ski centres** and request data on the number of ski days sold in the previous ski season, including the definition of ski days. 2. **Collect data from ski centres** on the dates when they were open for skiing each year. The best approach is to collect data in the off-season (July – August). 3. **Add up the number of ski days** for all ski resorts in the country for the previous season. 4. **Find the average number of ski days for the season** by dividing the total number of days by the number of ski centres. 5. Take the number of national annual ski days for the most recent year (A) and divide it by the number for the year immediately preceding it (B). Then multiply this number by 100 to get the percentage change*. ***Percentage, proportion (%; A/B x 100)*** 6. **The data should also be disaggregated by region and altitude** to see differences in rates of change. For classification by altitude, ski centres that are at an altitude of 2000+ meters above sea level are categorised as high-mountain, while all below 2000m are categorised as medium/low-mountain centres. 7. **Sort the findings to separate the ski resorts that use and those that do not use artificial snow.** *It is important to note that the change from year to year may not be indicative of long-term trends. For example, there may be an 80% decrease in the first year and then a 50% increase in the following year. This may seem positive, but it can be a significant decrease compared to two years ago.		
Initial data (2023)	*TBC*		

Medium-Term Reference Framework (TBD)	*TBC*
Long-term reference framework (TBD)	*TBC*
Target trend	Increasing
Additional information	2023 was the first year on record when two significant ski areas, Kolašin and Žabljak, did not have a single ski day due to lack of snow. These two resorts are the only ones that have peaks above 2000m above sea level. Altitudes below this are becoming economically unviable for ski resorts, due to the lack of reliable snow cover across Europe. A significant investment in the development of artificial snow production is proposed for Kola[in. However, the project is expensive and requires large quantities of fresh water and energy.

T.3: Number of high-altitude mountain pastures (katuns), ethno-villages and eco-tourism-based businesses.

Category	Description		
Indicator name	Number of high-altitude mountain pastures (katuns), ethno-villages and businesses based on eco-tourism.	**Unit**	Number
Indicator category	Adaptation activity		
Objectives	**Operational objective:** o **TOO1.1** Implementation of a diverse tourism offer to enhance resilience of the sector. **Adaptation measures:** • **T1.1.1** Developing Community-Based Tourism Programs as a Strategy for Building Climate Resilience e.g. promoting rural, agricultural and eco-tourism and other high value, low impact tourism products.		
Short description	**Katuns, ethno-villages and eco-tourism-based businesses play a key role in promoting sustainable tourism.** They often implement environmentally friendly practices that reduce the negative impact on the environment. These practices include the use of renewable energy sources, recycling, water conservation, and reducing waste to a minimum. As such, these types of tourism businesses are considered more sustainable with a low climate impact in terms of greenhouse gas emissions. However, these businesses can be vulnerable to climate hazards due to their location (located in mountainous areas) as well as the importance of Montenegro's cultural heritage. **The number of katuns, ethno-villages and eco-tourism-based businesses is monitored through the Central Tourism Register.** The competent local self-government authorities are required to submit to the Ministry without delay the final decisions they make on the basis of the approval from the Law on Tourism and Hospitality (Official Gazette of Montenegro no. 2/2018, 4/2018 - corrected, 13/2018, 25/2019, 67/2019 - other laws and 76/2020) with completed forms for registration, i.e. deletion from the register, no later than three days from the date of issuance of the final decision. **Definition:** • **Ethno-village** - A tourist destination that aims to preserve and display traditional Montenegrin culture, way of life and heritage. The villages offer visitors an authentic experience of rural Montenegrin life, usually with traditional architecture, culture preservation, authentic cuisine, handicrafts, natural surroundings, and family entrepreneurship.		

	• **Katuns** are traditional seasonal mountain settlements or huts in Montenegro and the wider Balkan region that are used by shepherds and form a key cultural heritage practice in the country. • **Eco-tourism-based businesses** prioritize reducing their environmental impact through initiatives that may include energy and water conservation, waste reduction, and recycling. They often support and showcase traditional Montenegrin culture and/or offer nature-based activities such as hiking, biking, and rafting. They can also have environmental certifications and should adhere to global standards such as the criteria of the Global Council for Sustainable Tourism.		
Data type	Quantitative *Data can be collected through a request to the Ministry of Tourism.*	**Data source**	Ministry of Tourism – Central Tourism Register https://ctr.gov.me/
Responsible institution	Ministry of Tourism		
Frequency of data collection	Annually, although the data are collected continuously through the Central Tourist Register	**Frequency of reporting**	Annually
Description of the methodology	1. **Define the scope of data collection:** • Identify and categorize katuns, ethno-villages and eco-tourism-based businesses based on the above definitions. • Determine the key data that will be collected, such as location, type of service, and capacity. 2. **Identify data source:** • The data should be collected from the existing Central Tourism Register maintained by the Ministry of Tourism. • Where necessary, additional data should be collected through surveys with all companies that may qualify for this indicator. 3. **Additional surveys should ask for the following information:** • Name of the business/legal entity • Type (katun, ethno-village, or eco-tourism-based business) • Location • Ownership and management data, including gender of the owner • Year of establishment • Services provided • Number of employees • The annual number of visitors • Applied environmental and sustainable practices. 4. **Data analysis** • Review completed surveys and identify the number of businesses that qualify. Add these businesses to the number of qualified businesses listed in the Central Tourist Register. Report this number every year. https://ctr.gov.me/		
Initial data (2023)	*TBC*		
Medium-Term Reference Framework (TBD)	*TBC*		
Long-term reference framework (TBD)	*TBC*		
Target trend	Increasing		
Additional information			

Indicators of climatic parameters

CP.1: Average monthly temperature.

Category	Description		
Indicator name	Average monthly temperature	**Units**	C^0
Indicator category	Climate parameter		
Objective	This indicator is in line with all operational objectives of the Climate Change Adaptation Plan.		
Brief description	This indicator measures the average temperature over one month, calculated by monitoring the average daily temperatures recorded at meteorological stations located throughout Montenegro. The indicator therefore provides a view of the typical temperatures experienced during a month and can be used to visualize temperature trends. It is applicable in all sectors, but especially in the agriculture, health and water sectors. The data collected also points to spatial differences across the country and helps to understand the impact of climate change on specific communities, resources, and ecosystems. A limitation of this indicator is that extreme values can be disguised within the average data. Therefore, it is imperative for this indicator to be supplemented with another indicator that measures temperature extremes.		
Data type	Quantitative	**Source**	Institute for Hydrometeorology and Seismology
Responsible institution	Institute for Hydrometeorology and Seismology		
Frequency	Monthly	**Reporting**	Annually
Description of the methodology	These steps should be taken every year to collect data for this indicator: Ensure that meteorological stations are operational and are deployed regionally throughout Montenegro. Collect average daily temperature data for each month. Calculate the mean temperature for each day at each station within the month by combining the daily minimum and maximum temperatures and dividing them by 2. Gather daily mean temperatures to obtain the mean monthly temperature for each weather station. This can be done by adding up the daily average temperatures during the month and dividing it by the number of days in the month. Process data to eliminate any inconsistencies or errors. Calculate the national mean monthly temperature by collecting data from all national meteorological stations and by combining them, and then divide it by the number of meteorological stations. Repeat the process for each month of the year. Segregate the data by: (i) season (spring, summer, autumn, winter), (ii) municipality.		
Initial data (2024)	*TBC*		
Medium-term reference framework 2025 - 2030	*TBC*		
Long-term reference framework	*TBC*		
Target trend	*TBC*		
Additional information			

CP.2: Monthly precipitation

Category	Description		
Indicator	Monthly precipitation	Units: mm/month	Units: mm/month
Indicator category	Climate parameter		
Objectives	**Operational objective:** • **AOO1.2.** Enable informed decision making through monitoring and data collection, storage and sharing. **Adaptation measures:** • **A1.2.3.** Implementation of models for simulating crop yields and predicting plant diseases and improve the phenological database, supported with a data collection and management system. • **A3.1.3.** Implement Irrigation infrastructure for drought resilience. • **W1.1.1.** Strengthen the network of measuring stations and improve the monitoring of water related data.		
Short description	Montenegro has a variety of topographical features, where the rainfall varies. Certain parts of Montenegro receive some of the highest rainfall in continental Europe, while others (mainly in the northern region) have less than 800 mm. In general, larger rainfall is recorded from September to April, while the drier and warmer period is from April to September. Climate change is likely to increase periods of prolonged drought, as well as intensify rainfall events. Measuring precipitation in millimetres (mm) per month is the standard approach to this indicator, while mm/year is too broad metrics to observe changes in precipitation during a season, and mm/day can be distorted by heavy rainfall in some areas and lack of rain in others. Measuring monthly precipitation provides a better overview of changes in the amount of precipitation in the country. However, this does not necessarily show increased variability between extremely high and low precipitation. For example, dry conditions at the beginning of a month and heavy rainfall at the end of that month can show the usual precipitation pattern for the entire month as average. This indicator also does not automatically include locations, which means that one drier area, such as the north, may suffer drought, while above-average precipitation in other areas may cause the indicator to register normal rainfall. This can be solved by segregating the data by regions, which would give a clearer picture of precipitation across the country.		
Data type	Quantitative	**Source**	IHMS
Responsible institution	IHMS		
Frequency of data collection	Monthly	**Reporting**	Annually
Description of the methodology	These steps should be carried out on an annual basis to collect data for this indicator: Identify a network of meteorological stations across Montenegro, evenly distributed across rural and urban areas. Record monthly precipitation at each weather station, ensuring consistent measurement times at all stations and using the same measurement techniques. Measure the rainfall in millimetres at each station. Collect data and calculate the average rainfall (in mm) by adding up all recorded precipitation and dividing it by the number of stations. Break down the results by: (i) municipalities, (ii) meteorological stations. Analyse this data by comparing the rainfall in each municipality for the previous month with the average at the national level. This data should also be compared with the historical averages of the region. Historical averages can be obtained by collecting all measurements at each weather station, segregating the data by month, then adding up all the data for each month and dividing it by the number of years during which the data were collected. This allows you to compare the current data with historical averages.		

Initial data (2024)	*TBC*
Medium-term reference framework 2025 - 2030	*TBC*
Long-term reference framework	The rainfall doesn't look like it's going to change. However, there is a long-term goal of accurate and standardized measurement of the rainfall across Montenegro.
Target trend	No change.
Additional information	

CP.3: SPEI drought index

Category	Description		
Indicator name	SPEI Drought Index	**Unit**	The standard deviation value.
Indicator category	Climate parameter		
Objectives	This indicator is aligned with all operational objectives of the Climate Change Adaptation Plan.		
Short description	Drought is a key issue in the water, agriculture, health, and tourism sectors and in cross-cutting activities. Accurate drought measurement can help to understand trends and can indicate where resilience measures need to be implemented. The Standardized Evapotranspiration and Precipitation Index (SPEI) is based on climate data and can be used to accurately determine the onset, duration, and severity of drought relative to normal conditions in a given area. Unlike other drought indices, this index can identify types of droughts and their consequences in the context of global warming. It does this by taking into account both precipitation and potential evapotranspiration (PET) when calculated. Currently, this indicator includes measurements at a relatively high level and does not provide detailed information on local or regional differences in risk of drought in Montenegro.		
Data type	Quantitative	**Source**	IHMS
Responsible institution	ZHMS		
Frequency of data collection	Monthly	**Reporting**	Annually
Description of the methodology	These steps should be carried out on an annual basis to collect data for this indicator: Determine the latitudes and longitudes of key drought monitoring areas. Select the available data covering the territory of Montenegro, which may include the border areas of neighbouring countries, and record the results. Include historical data to identify recent trends. Collect data and calculate average SPEI scores for drought, by summing up all SPEI records and dividing it by the number of data collection points. Analyse these data by comparing the SPEI scores for each municipality from the previous month with the state-level average. This data should also be compared with historical averages for the region. Much of this data has already been collected and made available on the SPEI drought monitoring platform. Historical averages can be calculated by taking all measurements from each weather station and segregating the results by month. Adding up all the data for each month and dividing it by the number of years over which the data was collected will yield a historical average that can be used to compare it with current data.		
Initial data (2024)	SPEI Index Database https://spei.csic.es/index.html		

Medium-term reference framework 2025 - 2030	*TBC*
Long-term reference framework	*TBC*
Target Tendency	Decrease
Additional information	Long-term data can be found at: https://spei.csic.es/spei_database/

CP.4: Number of days with extreme weather conditions.

Category	Description		
Indicator	Number of days with extreme weather conditions.	**Unit**	Number
Indicator category	Climate parameter		
Objectives	This indicator is aligned with all operational objectives of the Climate Change Adaptation Plan.		
Short description	The frequency, intensity, and patterns of extreme weather events are projected to experience changes compared to historical baselines in the context of climate change. This indicator measures the number of days when extreme weather events (heat waves, cold waves, heavy rainfall, storm events) were recorded per year. The definition of thresholds for each extreme weather event can be in the form of international standards or deviations from the average. For example, heatwaves can be defined as "periods of at least two consecutive days during the summer (June to August) with a maximum apparent temperature and a minimum air temperature exceeding a local reference threshold derived from the 90th percentile for a given region and a specific time of year" (EEA, 2023). An extreme weather event is defined by the Intergovernmental Panel on Climate Change (IPCC) as "an event that is rare within its statistical reference distribution at a particular location" and further states: "Definitions of 'rare' vary, but an extreme weather event would typically be as rare or rarer than the 10th or 90th percentile" (IPCC, 2001). A potential limitation of this indicator is that, while it is useful to provide an overview at the national level, it does not take into account regional variations and the intensity of extreme weather events. It can be supplemented with other indicators or broken down by region to see more detailed trends.		
Data type	Quantitative	**Source**	IHMS
Responsible institution	ZHMS		
Frequency of data collection	Monthly	**Reporting**	Annually
Description of the methodology	To monitor this indicator, it is necessary to take the following steps: Define relevant thresholds for extreme weather events, using international standards or deviations from the historical average. For example, for heat waves, the threshold may be the 90th percentile of the monthly maximum apparent temperature. For heavy rainfall, the threshold can be the 90th percentile of monthly precipitation over the past 10 years. Collect data from the IHMSCG on temperature, precipitation and storms. Count the number of days during which the thresholds are exceeded. Sort the data by: (i) municipalities, (ii) the type of extreme weather event. Conduct trend analysis to spot patterns over time.		

	If resources and capacities are available, the data can be disaggregated to a smaller regional level (e.g. municipal level). Complementary data that can be collected include the number of people affected (injured, mortality rate) and the economic losses incurred annually due to extreme weather events.
Initial data (2024)	*TBC*
Medium-term reference framework 2025 - 2030	Not applicable
Long-term reference framework	Not applicable
Target trend	Decrease
Additional information	

CP.5: Number of warm days

Category	Description		
Indicator name	Number of warm days	**Units**	Number
Indicator category	Climatic parameter		
Objectives	This indicator is aligned with all operational objectives of the Climate Change Adaptation Plan.		
Short description	The number of warm days in Europe has increased since the 1980s, and with climate change, this trend is expected to continue under all scenarios. The number of warm days is a standard climate indicator collected globally and is classified by the European Environment Agency (EEA) as a high-priority indicator, suitable for a pan-European context. Accordingly, the index described in this document counts the number of days during the year when the daily maximum temperature is above 30°C, as reported by the EEA. In addition, the indicator will collect additional thresholds of 35°C and 40°C, which are of great importance for the Montenegrin climate and extreme heat measurement. Measuring warm days has a wide range of applications in all sectors, but it is particularly relevant for healthcare, water management, tourism and agriculture. Currently, this indicator will not accurately capture the differences between urban and rural areas and therefore will not take into account localized differences caused by anomalies such as the urban heat island effect.		
Data type	Quantitative	**Source**	IHMS
Responsible institution	IHMS		
Frequency of data collection	Monthly	**Reporting**	Annually
Description of the methodology	These steps should be taken annually to collect data for this indicator: Identify the network of meteorological stations across Montenegro, evenly distributed in rural and urban areas. Record daily maximum temperatures at each meteorological station, ensuring consistent measurement times at all stations. Count the number of warm days for each station when the temperature exceeds 30°C, 35°C and 40°C. Collect data by finding the highest number of warm days recorded at all weather stations. Repeat the procedure for warm days above 35°C and 40°C. Segregate the results by: (i) municipality, (ii) meteorological station.		
Initial data (2024)	*TBC*		

Medium-term reference framework 2025 - 2030	*TBC*
Long-term reference framework	*TBC*
Target trend	No change or decreasing.
Additional information	

Gender and inclusivity indicators

R.1: % of women who receive funds for climate change adaptation.

Category	Description		
Indicator name	Percentage of women who receive funds for climate change adaptation.	**Unit**	*%*
Indicator category	Gender equality		
Objectives	This indicator measures the objectives of the Climate Change Adaptation Plan (CCAP) that are gender-sensitive and transformative, including: Operational objectives AOO 2.2. Improve financing for climate change adaptation. CCOO 3.1 Embed gender, equity and social inclusion considerations in preparedness activities. Adaptation measures A3.1.1. Enhancing the application of climate-smart agrotechnical measures. A3.1.2. Identifying and implementing measures to reduce climate stress on livestock. A3.2.1. Preservation of hay meadows and pastures and the promotion of sustainable land use practices. T1.2.2 Providing financial and non-financial support to tourism-based communities who are vulnerable to climate change to help diversify and adapt to climate change, with sustainable tourism offer. T1.2.3 Improve funding opportunities to facilitate research and innovation into sustainable tourism practices and how they could be implemented more widely.		
Short description	Women and men are differently affected by climate change, and adaptation and mitigation strategies have gender-differentiated impacts. Women often face difficulties in accessing climate finance and adaptation due to inequalities related to property ownership, business skills, representation in decision-making processes and access to information. Therefore, financing mechanisms for climate change adaptation should seek to reduce, not deepen, this gap. Thus, climate change adaptation financing can be used as a tool to reduce existing gender inequalities in Montenegro. This indicator measures the proportion of climate change adaptation finance sources that women or women-led businesses have access to and use. Quantifying the percentage of women who receive climate change adaptation funding also provides insight into annual trends to track progress. Climate change adaptation finance includes any financial resource (loans, grants, technical assistance, or other types of financial incentives) that is awarded to support communities, companies, countries, and regions to adapt to the climate change impacts.		

Data type	Quantitative	**Source**	Ministry of Finance, MONSTAT
Responsible institution	Ministry of Ecology, Sustainable Development and Northern Region Development		
Frequency of data collection	Annually	**Reporting**	Annually
Description of the methodology	This indicator should be monitored in line with the following steps: Develop a database to record climate change adaptation financing that was approved or borrowed during the previous fiscal year. This should be collected in an Excel spreadsheet that contains at least the following columns: Name of the recipient of climate change adaptation funds (e.g. project, program, sector, company or individual recipient) Sector (e.g. health, water, agriculture, tourism) Municipality Type of climate change adaptation funding (e.g. grant, loan, etc.) Amount granted or borrowed under a financial instrument The total amount of climate change adaptation financing received/paid in the country, summing up all the amounts recorded in point 1c. Break down data by gender to record the percentage of funds allocated to women or women-run businesses. This can be included as an additional column in the Excel spreadsheet: Record the gender of the recipient of the funds. If a financial instrument, such as a loan or grant, is awarded to multiple beneficiaries including men and women, calculate the percentage that is allocated to women or women-run businesses and the corresponding amount using the following formula: (Number of women) / (Total number of persons) * 100 For example, if a group of directors included 1 woman and 2 men, the percentage would be 33%. Calculate the percentage of climate change adaptation funding specifically allocated to women, dividing the number of women who have received funding by the total number of individuals who have received funding in Montenegro: (Adaptation funding received by women) / (Total adaptation funding in the country) * 100 Future steps: As part of the future development of the indicator, it is recommended to segregate it by the total financial value of climate change adaptation funding allocated to women. This will allow to record the amount of loans and grants available to women.		
Baseline data (2024)	No information available		
Medium-term reference framework 2025 - 2030	*TBC*		
Long-term reference framework	50%		
Target trend	Increase		
Additional information	Data collection for this indicator may be challenging at first and may be limited to government-provided adaptation funding, but the suggestion is to include all adaptation funding allocated to Montenegrin individuals and organisations (e.g. from multilateral organisations) at a later stage.		

Annex D: Climate vulnerability findings

A detailed vulnerability assessment was conducted for each of the sectors included in the CCAP, and a detailed breakdown of the components of each sector's vulnerability, broken down by exposure, adaptive capacity and sensitivity is provided in this appendix. The information below provides the basis of the adaptation measures that were selected and are prioritized.

Agriculture - Components of Climate Risk for Agriculture Sector in Montenegro

Exposure	Increase in mean annual temperatures on land	The increase in temperature so far has had an observed impact on the fruit subsector, which is one of the fastest growing segments of Montenegrin agriculture. The vegetation period is shifting towards the beginning of the year – the flowering of apple and plum varieties and the maturation of grapes and olives occurs several days earlier, and phenophases of some plants are shortened (REF). This exposes crops to higher temperatures, late spring frosts and extreme events, especially in the Northern regions. Increases in temperatures are also linked with soil warming. The central and coastal regions in particular are exposed to solar radiation and wind erosion of the soil. Increase in soil temperatures, and the temperature threshold of 10˚C occurs few days earlier in relation to the climate norm. The increase in temperature is expected to accelerate temperature accumulation in plant and accelerate growth stages, during which less biomass will be accumulated. However, the increased temperature is expected to lengthen the duration of the growing season (projected: 11 days in the uplands, 18 days in the lowlands) and a longer part of the year will have favorable thermal conditions for crop production . For certain crops, favorable conditions will shift locations towards the north and higher altitudes.
	Decrease in annual rainfall	Parts of Montenegro have historically been arid, but with the shorter periods of rain and higher number of consecutive dry days that have already been observed, and the prolonged droughts that are projected, the water availability is increasingly becoming an issue throughout the country. Particularly affected are the key agricultural areas in the central region – Zeta and Bjelopavlici Plains, as well as the coastal areas. This will affect the availability of water for agricultural production and also increase the pressure on the water supply and possible conflicts over water use, especially within the tourism sector.
	Increased occurrence of hailstorms and strong winds	The occurrence of hailstorms and strong winds has increased in recent years, and this trend is projected to continue. In 2022 there was an extreme hailstorm that in a single day caused extensive damages to production in the Zeta plain, including to the vineyards and orchards of the largest national food company „Plantaze“ with the estimated costs of 8 million EUR.
	Increased incidence of droughts	The key agricultural areas (Zeta and Bjelopavlici Valleys) and the coastal area are slightly to moderately vulnerable to droughts, some areas within these regions have high vulnerability (steep mountain slopes along the coast). Projected higher number of consecutive dry days and shorter rainy periods are expected to cause increased aridity and desertification.
	Increase exposure to floods in lowland areas	Lowland areas, in particular Zeta and Bjelopavlici Plains, the region around Bojana River, parts of Lim River valley are exposed to fluvial flooding, and have already been affected by the major flood events in the previous decade, resulting in damages to crops and infrastructure, decreased yields, quality and safety of agricultural products, water logging of soils. Changes to the distribution of rainfall is likely to increase flooding incidence.
	Increased occurrence of late spring and early autumn frost	Agricultural areas in the north are becoming increasingly exposed to the late spring and early autumn frost due to climate change. This in particular affects the fruit flowering and maturation and thus yields and quality.

	Livestock and plant diseases	Climate change is leading to a higher susceptibility to diseases, increased incidence of new diseases in Montenegro affecting yields and increased production costs.
	Changes in conditions of marine habitats	The fishery and aquaculture sector are affected by the changes in freshwater (Skadar Lake primarily) and marine (Adriatic Sea) habitats. The warming is affecting the water temperature, salinity, pH and oxygen availability and thus the population dynamics of commercial species.
	Higher occurrence of invasive marine species	The occurrence of alien and invasive species is increasing in the Adriatic Sea, and is already affecting the population sizes of native fish species (causing local extinctions), including commercial species (including causing local extinctions) and thus catches (Third National Communication).
Sensitivity	Variable topography and high percentage of land of slopes (65% of territory has slopes higher than 10%, 28% between 5-10%) makes soils in agricultural areas prone to erosion, especially during extreme weather events, resulting in the loss of topsoil. This is set to exacerbate due to climate change.	
	Agriculture is conducted mostly in the open air and thus exposed to impacts on weather of climate change, which is likely to impact yields. The animal husbandry sector has a high percentage of modern high-productive cattle breeds that are less tolerant to heat stress than autochthonous breeds. Expected impacts of heat stress include lower milk production, reduction in fertility and calving rate, higher susceptibility to diseases, body condition loss due to lower feed intake.	
	Agricultural infrastructure for animal husbandry and plant production (e.g. barns, greenhouses, irrigation infrastructure, etc.) is inappropriate for heat waves and extreme weather events, causing stresses and lower yields	
	Some areas have historically been water scarce, due to geographic position, topography and geology (karst), which will be exacerbated by climate change	
	Production is characterized by the use of inadequate crop varieties and hybrids and poor implementation of agritechnical measures. Additionally, there is genetic erosion and disappearance of autochthonous animal breeds and plant varieties.	
	Montenegrin agriculture, especially in rural households, is characterized by low level of processing. This produces products with short shelf life, which are more sensitive to spoilage that may result from increased temperatures and occurrences of pests and diseases.	
	Agricultural operations predominantly occur on small and dispersed farms lacking relevant knowledge and cooperative mechanisms, rendering them susceptible to the effects of climate change. The majority of farm proprietors possess inadequate education and knowledge. 46% of farmers are aged 55 or above, this ageing trend being on the rise. There are social and cultural barriers in embracing change, adopting novel practices, and forming unions, all of which are required for adaptation.	
Adaptive capacity	Policy, legislative and institutional framework	There are no formally established climate adaptation planning processes relevant for the agriculture sector. The coordination and the adaptation planning are done on an ad-hoc or project driven bases, with no clearly defined stakeholders, roles and responsibilities. Although agricultural policy does recognize climate change, this issue is not mainstreamed across the strategies, legislative and institutional framework, and it lacks concrete adaptation measures that would ensure an increase in the sector's resilience. Incentive schemes, in particular, are rather limited in this respect, and climate change adaptation measures are not explicitly formulated.
		There is an overall poor enforcement of soil management, animal welfare policies and good agricultural practices, all of which contributes to the adaptive capacity of the sector.
	Data and knowledge base	Data and knowledge base is characterized by the weak information basis on all aspects of agriculture. The network of meteorological stations is deficient and needs improving (upgrading the equipment, data management systems and timely information dissemination). The system doesn't provide relevant agrometeorological information in a timely manner for the farmers to get prepared. The existing data has poor spatial resolution and the temporal series is not suitable for performing analysis nor unified in a single database.

		The existing capacity-building programs targeting farmers, extension services, and other agricultural professionals are inadequate for addressing climate change challenges. The integration of climate change issues in capacity building initiatives remains insufficient. There's a lack of integration of traditional and local knowledge.
	Infrastructure	Production on small farms depends on precipitation or local water supply such as springs and groundwater wells. In peri urban areas, farms mostly use water from the public supply networks, which also creates competition with the water supply sector.
	Stakeholder capacities	The agricultural stakeholders, farmers in particular, have low adaptive capacity. This is due primarily to the small holdings, low economic power, but also aging farmers. The producers' associations are underdeveloped, and there is a general lack of cooperation and coordination among the stakeholders, which increases their vulnerability to climate change. Their awareness of climate change and its impacts and knowledge regarding adaptation options are lacking, and the existing capacity building programs for farmers, extension and advisory services and other agricultural professionals are unsuitable for dealing with climate change. Additionally, there are social and cultural barriers that slow down the acceptance of new agricultural knowledge and skills required to meet the challenges of production under climate change.
		There is a general lack of awareness of climate change and its impacts exist across the sector's stakeholders. The stakeholders also lack relevant knowledge on aspects of agriculture that are of relevance to adaptation to climate change, such as soil management under climate change conditions, alternative agricultural practices and dealing with the new pests and diseases.
		The collaboration and coordination among stakeholders is lacking. There is weak coordination, and cooperation between responsible institutions and other relevant actors. The associations of producers are undeveloped. Additionally, there is inadequate cooperation both within the country and with international research centers.
		The adaptive capacity can be enhanced through development of rural tourism that increases the demand for locally grown agricultural products

Source: (Vulnerability Assessment for the Agriculture Sector 2022, Third National Communication, Strategy for Development of Agriculture and Rural Areas 2015-2020.)

Water - Components of Climate Risk for Water Sector in Montenegro

Exposure	Increase in mean annual temperatures	Climate change-induced impacts in various regions, notably the Zeta River valley and the North, exacerbate vulnerability to water-related challenges. Increased evaporation and decreased seasonal snowpack strain water availability. Heightened water use during summer reduces net water supply and intensifies competition, further impeding access to adequate water quantity and quality. Rising temperatures degrade habitat quality and productivity, disrupting aquatic ecosystems.
	Decrease in annual precipitation	The frequency of days with over 1 mm precipitation has notably decreased, while those with more than 40 mm have risen, signaling a drier climate with more frequent extreme precipitation events. Climate projections anticipate further declines, potentially up to 20% across the country, especially in snowfall (which may see reductions of about 70%–80%). Anticipated consequences include reduced stream flow (projected 27% decrease in average annual flow by the end of the 21st century), lowered aquifer replenishment, declining water table levels, and increased sediment transport due to diminished runoff and warmer water temperatures. Additionally, reduced water supply (including for irrigation), diminished water quality, escalated competition for scarce resources, compromised extraction efficiency, and lower annual yields for rechargeable systems, potentially leading to increased groundwater pumping costs. These impacts will reverberate through existing and planned hydrological systems, affecting their functionality and performance. Particularly vulnerable areas include the Zeta-Bjelopavlici Valleys and the Lim and Tara River basins. These regions are poised to experience significant challenges due to these shifts in climate patterns.

	Increased flood risk	Climate anomalies show high correlation with surface water anomalies, predominantly resulting in an elevated flood risk. This risk is primarily manifested through two categories: (1) Fluvial floods driven by intense rain events over a few days, potentially reaching 500-1000 liters per square meter in extreme cases, and covering extensive areas; and (2) Meteorological floods encompassing pluvial and flash floods that are localized and more likely in torrential or urban settings. These shifts bring forth adverse health impacts, marked by compromised drinking water safety and increased incidence of waterborne diseases. Additional issues include increased erosion and sediment transport (causing increased sedimentation in storage reservoirs), runoff of pollutants, diminished groundwater replenishment and infrastructure damage. Particularly vulnerable areas include southern regions around Ulcinj, Sutomore, Kotor, Herceg Novi, Crkvice, sections of Lustica Peninsula, and vicinity of Skadar Lake including Virpazar, Ostros, and Vladimir. Other areas at risk are Zeta and Bjelopavlici plains, Karst fields (particularly Niksic and Cetinje), the Lim valley between Plav and Berane, the Ibar valley around Rozaje, and the Cehotina valley around Pljevlja. All urban centers are susceptible to flash floods, coastal cities in particular.
	Sea level rise and storms	Coastal regions from the Boka Kotorska Bay to the mouth of the Bojana are exposed to the wave action and inundation. The combination of intense waves, sea currents, and rising sea levels due to climate change accelerates coastal erosion and makes it more difficult to maintain natural and constructed beach embankments and other coastal infrastructure. This also increases the risk of saltwater intrusion, leading to freshwater and soil salinization. Anthropogenic factors, particularly unplanned construction and interference with natural streams that replenish shoreline with sediment, can further aggravate these natural processes. Highly affected regions include Ulcinjska Solana, Ada Bojana, and the southern section of Velika Plaža, Morinj and Tivat salts pans in Boka Kotorska Bay. The analysis shows that along the entire coast there are settlements in the areas threatened by sea level rise.
Sensitivity	The diverse topography and geology of Montenegro contribute to its vulnerability to various hydrological events. A considerable portion of the land is on steep slopes, making it susceptible to torrents and rapid runoff. Lowland regions close to rivers and lakes are at risk of flooding. The distribution and abundance of water resources vary significantly across the country, encompassing arid karst terrains to regions rich in both surface and groundwater sources. The northern and southern areas are particularly prone to torrential rain due to their topographical characteristics. Montenegro is characterized by around 300 torrential basins, which further contributes to its vulnerability to these hydrological challenges.	
	Water supply for population, industry and agriculture depends primarily on groundwaters, majority of which are in karstic areas, which are sensitive to climate change.	
	Water resources are under high pressure from various forms of use (consumption by humans; agriculture and industry; as well as a suite of non-consumptive uses). Particular pressure is from the energy sector, which comprises 99% of industrial water use, and bases its development plans on utilization of hydropower potential.	
	Inadequately managed land increases the sensitivity of the land to climate change – this includes unplanned urbanization that expands watertight surfaces, deforestation (including illegal logging), intensification of agricultural production and inadequate waste management. The latter is particularly pronounced in the southern region, where torrential channels get clogged due to illegal disposal of waste and unplanned urbanization, which reduces their capacity to drain water and creates bottle-necks, increasing the force of water that causes aggressive soil erosion.	
	Protection of water sources is deficient – only 49 of about 90 springs used for water supply have designated protection zones. The main water source for the coastal area (Bolesestre spring in Skadar Lake region) is under threat from illegal gravel extraction in its vicinity.	
	Beaches and habitats on low lying parts of the coast are sensitive to coastal floods, sea level rise and risk of disappearing.	
Adaptive capacity	Policy, legislative and institutional framework	The management of water resources is not on the appropriate level and it doesn't take into account the estimated risks from climate change.
		Financial capacities are limited and there is a need for high financial investments into the water infrastructure, for things such as improving the water supply and wastewater treatment facilities, irrigation and flood protection systems.
	Data and knowledge base	There is a lack of detailed, specific and quantified data about sectoral vulnerability (especially on the water supply system, as well as hydrological data) and potentials for climate adaptation.

	Infrastructure	Water supply system depends largely on groundwater sources, and lack diverse water supply options. Technical measures such as water reservoirs, desalination etc are not being implemented. The coastal region, in particular, depends on two main sources of water, which are becoming unreliable. 1) the regional water supply system for the coastal zone supplies most of the coastal settlements from the spring Bolesestre in the Skadar Lake area. This spring is under threat from the illegal gravel extraction, which significantly decreased the flow. Increased pressure on the supply system occurs in the summer months, during the tourist season. 2) water imports from Croatia for the municipality of Herceg Novi, which is not under Montenegrin authority and subject to political circumstances.
		Roma and rural populations are the most vulnerable groups when it comes to the access to water and improved water services, as well as water in sufficient quantities for the household purposes.
		Deficient wastewater treatment facilities, irrigation and flood protection systems.
		Unsustainable use of water from the public supply network stemming from the high losses of up to 60% that occur along the water supply network due to outdated infrastructure and illegal water extraction.
	Stakeholder capacity	There is a general lack of knowledge, skills and data of the decision makers and other stakeholders in relation to climate change adaptation.

Health - Components of Climate Risk for Health Sector in Montenegro

Exposure	Rising temperatures and heatwaves	The trend of rising daily temperatures is observable across all regions of Montenegro, with the highest average summer temperatures recorded in areas like Podgorica and the River Zeta Valley. This temperature increase also correlates with a rise in the occurrence of hot nights. Heatwaves are becoming more frequent and lasting longer compared to historical data, posing a particularly pronounced risk to urban centers such as Podgorica and southern coastal cities like Bar. Groups particularly vulnerable to temperature increases include the elderly, chronically ill patients, pregnant women, children, and socially marginalized populations (such as Roma and displaced persons). The direct health impacts include heat stress and an increased likelihood of premature death, particularly among the elderly and those with chronic conditions. Pregnant women are at risk of increased blood pressure due to the high temperatures. Indirect health impacts include an extended pollen season that affects people with allergies and chronic respiratory illnesses, undernutrition due to reduced agricultural yields and diminished nutritional content in crops, as well as economic damages from reduced productivity, incapacitation and premature deaths.

	Reduction in precipitation and increased occurrence and duration of droughts	In combination with the increased temperature and heatwaves, it will indirectly impact health through decrease in water availability and undernutrition due to crop failures and reduced quality of agricultural products. People over 65 are the most vulnerable to heat-related illnesses since they live in some degree of constant dehydration, regardless of the weather conditions. People living in arid rural areas (central and south parts) are also at risk, regardless of their age.
	Deteriorating air quality	Includes the increase in the concentration of greenhouse gasses and particles from global emissions, as well as local processes. Forest fires that are becoming more frequent due to climate change significantly increase the risk. Air quality in particular impacts patients with chronic diseases, as well as the health of pregnant women and fetal development.
	Increased inland and coastal flooding	Causes a range of direct health impacts like drowning, injuries, mental health effects, and water and food borne diseases (e.g. intestinal parasites, pathogenic bacteria). These effects can happen before, during, or after the flood events. Floods impact basic water availability and safety. They can also cause serious disruption in the infrastructure, which includes electric power, water, transportation, and communication systems that are essential to maintain access to health care and emergency response services that are of the highest importance in such events. The coastal zone is also prone to increase in sea levels and storm surges, which will impact the wellbeing through displacement and reduction of drinking water quality.
	Increased exposure to vector borne diseases and alien and invasive species that pose a health risk	An increase in vector-borne (transmissive) infectious diseases such as malaria, dengue, Lyme diseases, etc have been linked to climate variability and are expected to increase further as a result of climate change. Increased exposure to the alien and invasive species due to their range shifts is also to be expected, especially marine species (e.g. puffer fish, which causes poisoning and dermal problems). The health system will suffer from the increased expenditures for treating diseases related to climate change (Lyme disease, malaria, leishmaniasis, salmonellosis etc). Vulnerable groups are those living in the vicinity of water bodies and flood prone areas, as well as marginal groups with limited healthcare such as Roma population, inhabitants of remote rural areas.
	Increased occurrence and duration of wild fires	Wild fires cause direct health impacts - respiratory distress and increased risk of death and injury. They can also cause damage to health related infrastructure, and decrease the access to health services due to disruption of traffic. Rural areas are particularly vulnerable.
Sensitivity	Ageing population and high percentage of people with long-term illness or disability. In 2018, the proportion of people older than 65 was 15.1%, which is expected to rise between 23.6% to 28.5% of the population in the next 40 years. In 2016, the share of people with difficulties or disorders due to a long-term illness or disability was 40% for people aged 65 to 84, and 61% for those aged 85+. Higher concentration of the elderly is in the North.	
	Certain areas already have poor air quality (such as Pljevlja, Bijelo Polje, Podgorica) due to industrial and urban emissions, lack of clean fuels, which will be made worse by increased concentration of greenhouse gas and particles from global and local emissions (such as burning of unsafe fuels and wildfires). According to the WHO Health and environment scorecard for Montenegro, 38% of the population doesn't use clean fuels and technology for cooking and heating.	
	Weaknesses in the water supply system create public health risk problems during climate extremes. The existing deficiencies in this system stem from factors such as the absence of protection zones around water sources, inadequate sanitary measures for water reservoirs, an outdated distribution network with significant losses, and irregular disinfection protocols in most municipal water supply systems. This makes the water supply system susceptible to the challenges posed by rising temperatures, shifts in rainfall patterns, and heightened probabilities of extreme droughts or floods. This heightened vulnerability raises the potential for exposure to various waterborne pathogens, culminating in substantial public health hazards during climatic extremes. Particularly at risk are marginalized populations like the Roma community and rural inhabitants who lack the resources and infrastructure to mitigate these challenges effectively.	

	There is a geographic–regional discrepancies in the access to healthcare combined with a broader context of exclusion and vulnerability experienced by individuals residing in the northern regions and rural areas. These communities face a range of challenges, including limited economic opportunities, higher poverty rates, substantial distances to healthcare centres, and a scarcity of available services. These structural factors exacerbate an already fragile situation: an aging population in rural and northern areas, grappling with suboptimal quality healthcare, while the more skilled and younger demographic migrates towards urban and southern regions. There is unequal availability of resources in the primary health care for the population living in certain municipalities, resulting in inability to provide certain specialist health services in a timely manner.	
	High health inequalities owing to differences in living conditions; health related behaviors; education, occupation, and income; health care, disease prevention and health promotion services as well as public policies influencing the quantity, quality, and distribution of these factors. This also causes limited mobility and access to information and health services, especially for rural populations, women and marginalized groups (like Roma population).	
	As the agricultural sector is vulnerable to climate change, it will impact food safety and security. Health impacts include: undernutrition due to decreased nutritional quality and yields, unsafe food (due to increased use of pesticides, livestock diseases, food spoilage at higher temperatures, presence of invasive species).	
Adaptive capacity	Policy, legislative and institutional framework	There is no formally established climate adaptation planning process for the sector.
		Social care services, especially for the elderly, are deficient.
		There is a lack of designated financial resources for adaptation of the health sector to climate change.
	Data and knowledge base	There is no reliable data on the impact of climate change on human health, as this data has not been integrated with compulsory health records.
		Lack of data on vulnerable groups.
	Infrastructure	Health care facilities in many rural areas are lacking.
		Health care infrastructure not adapted for adequate response to climate change impacts (there are no relevant supplies and technologies, inadequate working conditions, deficient technical capacities for dealing with the hazard situations, problems with water sanitation).
	Stakeholder capacities	The number of healthcare professionals is insufficient - the availability of health care to the population is not adequate and in line with WHO strategies and recommendations. Health business in Montenegro is dispersed, employs a small number of people, and is not equally accessible in different regions (the north region having less access to private health sector).
		Healthcare workers lack awareness and skills related to climate change hazards. There are deficiencies in the risk assessment and management of crisis situations.

Tourism- Components of Climate Risk for Tourism Sector in Montenegro

Exposure	Rising temperatures and heatwaves	The current observed impacts of the rising temperatures and heatwaves on tourism is primarily in the increased energy consumption for air conditioning and demand for water in tourist hotspots in the summer months. In the winter, the rapid snowmelt, decreased reliability of snow as well as rain instead of snow all reduce skiing opportunities and significantly shorten the skiing season. This has already been taking toll on the main skiing centres Kolasin and Zabljak, but also in in Vučje and Ivanova Korita. The demand for the artificial snow increases the costs of maintenance of skiing slopes and puts additional pressure on the water resources. The rise in temperatures and the heatwaves duration and frequency is expected to impact the coastal and nature-based tourism even further, as the performing of the tourism activities (on the beach, hiking, biking...) will become more uncomfortable and reduce enjoyment of tourists. The coastal zone will hold less and less appeal to tourists, especially in the peak summer months. The demand for water and energy for air conditioning will continue to increase in tourist hotspots. Similar loss of

		appeal can be expected for the rural and culture-based tourism where the activities are performed outside. The gastronomic tourism can also suffer from the negative impacts to the food production systems (wine production for instance). On the other hand, there are a range of new opportunities: - Extending the tourist season to spring (April/May) and autumn (September, October), when the weather is more agreeable to tourists. - As the winter season becomes warmer, and snow declines, opportunities for adventure biking, hiking and climbing will increase. - The summer season in winter resorts becomes more important and innovation can drive product development into nature and activity-based tourism, thus providing increased employment and entrepreneurial opportunities.
	Rising water temperatures	Rising water temperatures impact the appeal of water-related activities like swimming and other leisure pursuits. Fisheries and the allure of wildlife observation, encompassing activities like birdwatching, scuba diving, and snorkeling, are directly influenced by elevated temperatures. Temperature increase can also trigger shifts in water quality due to eutrophication, altering the overall experience for visitors. The proliferation of invasive species, including those notorious for causing direct discomfort to tourists such as poisonous puffer fish and jellyfish, is on the rise. Ultimately, the cumulative effect of these factors can lead to a decline in the destination's attractiveness, and thus the loss of opportunities.
	Reduction in precipitation	Diminished precipitation heightens drought frequency, impacts the water supply, and triggers shortages, particularly in southern tourist areas. Such conditions impact biodiversity and landscape aesthetic, especially in the coastal wetlands, which can erode the attractiveness of the nature-based activities in these areas. In the North, reduced snowfall affects skiing and intensifies water demands for artificial snow, putting additional pressure on water and other resources.
	Decreased weather stability and increased occurrence of climate extremes	The escalating unpredictability of weather patterns and the surge in extreme climate events directly influence the appeal of a location and its appropriateness for various recreational activities. Flash floods, thunderstorms, hailstorms and landslides that have affected Montenegro had adverse effects on infrastructure, local enterprises, and the safety of both visitors and residents. These occurrences are more prominent along the coast, where their impact is exacerbated by factors such as unregulated urban expansion, obstructions in torrential channels caused by waste accumulation and construction, and outdated communal infrastructure. This phenomenon notably jeopardizes coastal tourism and maritime traffic, as well as the functionality and safety of ports like Tivat and Budva. Consequentially, it diminishes the perception of stability, appeal, and tranquility, potentially leading to a decline in visitation rates.
	Increased occurrence and duration of inland flooding	Inland floods are most prevalent in regions surrounding the Zeta, Moraca, Bojana, Lim Rivers, and Skadar Lake. The heightened frequency and extended duration of these floods, linked to abrupt snowmelt and shifts in hydrological patterns, poses significant safety concerns for both visitors and local residents, causes disruption of businesses (including restaurants, accommodation), tourist flows and patterns, and contributes to the loss of attractiveness.
	Increased occurrence of forest fires	In the last 15 years, more than 1,000 large forest fires were recorded in Montenegro, and an area of about 15,300 ha was burned and approximately 500,000 m^3 of timber damaged or destroyed. Forest fires rage during the peak tourist season, affecting visitor and resident safety, tourism infrastructure including campsites, destination reputation and image. Also diminishes landscape aesthetics and affects tourists' perceptions of stability, desirability, and calmness. Of particular vulnerability are the forests in the coastal and central regions. Research conducted in 2020 has demonstrated that airborne particulate matter stemming from wildfires escalates the risk to aquatic ecosystems, notably affecting Lake Skadar. This has consequential implications not only for the lake itself but also for the surrounding tourist hubs, amplifying the jeopardy to tourism-associated sites.
	Health risks from biological agents	Warming water bodies are witnessing heightened microbial activity and proliferating algal blooms. This not only disrupts the natural equilibrium of aquatic ecosystems but also raises concerns about water quality and safety. The warming conditions have also led to the emergence of alien and invasive species, some of which pose significant health risks, such are the poisonous fish and jellyfish. This threatens the safety of tourists engaging in water activities and the overall appeal of coastal destinations.

	Sea level rise	The projected sea level rise of the Adria affects beach recreation opportunities, as natural as assetic Sea by the end of the century is approximately 35 cm. Thists become unavailable or unattractive due to erosion. The impacts extend to tourism infrastructure and housing, leading to the loss of economic assets like restaurants, accommodations, and beaches. The functionality of vital infrastructure such as ports, marinas, and shipyards also comes under threat, subsequently diminishing the overall tourism appeal of coastal regions. The projections indicate that the most vulnerable areas are Ulcinj (especially Ada Bojana), Bar, Tivat and parts of Boka Bay (including Kotor).
Sensitivity	High dependence of the sector on coastal tourism, which is the most vulnerable from the impacts of climate change (increase in temperatures, decreased water availability and quality, sea level rise, wildfires, biodiversity decline, invasive species)	
	Montenegro's tourism offer is characterized by pronounced seasonality, with intense peaks in tourist arrivals during brief periods. The efforts to extend these high levels of seasonality have been of limited success.	
	Tourism is characterized by an uneven geographical distribution of tourist arrivals: 85% of tourist visits are in the coastal cities, primarily Budva, Herceg Novi and Ulcinj. From the visits in the north, most are in Kolasin and Zabljak (72%)	
	Unsustainable use of resources in tourist areas - such as unplanned urbanization, habitat loss, degradation, and the escalating influx of waste and wastewater collectively deteriorate the foundational resources for tourism. Furthermore, this phenomenon affects the torrential channels, heightening the susceptibility to hazards and risks.	
	Tourist hotspots, especially on the coast, depend on vulnerable and deficient water supply systems that lack diverse supply options and are increasingly unable to meet the water demands of tourists.	
	Sector extremely sensitive to crisis situations due to unsustainable development (lack of access in hazard situations, deficient sanitation and water supply systems, infrastructure of low energy efficiency). Deficiencies in the country transport system make it prone to prolonged disruptions and don't allow destination substitution	
	All ski resorts are below 2000 meters, which is a threshold below which any tourism activities dependent on snow are at risk. The existing winter sports infrastructure is inadequate, even considering its current usage patterns.	
	There are currently no measures in place for the protection from the sea level rise.	
Adaptive capacity	There are pronounced gender disparities - men are dominating in the ownership structure, especially of the rural tourism households, while women, with lower ownership share, are more vulnerable, especially in the North and Central regions	
	There is a lack of product diversification in the light of climate change.	
	Tourism plans to acknowledge environmental issues and conservation; however, they fail to meaningfully engage with the climate crisis.	
	Policy, legislative and institutional framework	Montenegrin tourism policy is still consistent with 20th century 3S tourism (sun, sand, sea) which has limited ability to generate high returns due to fierce competition, waning popularity with tourists, and because it is dependent solely on price competitiveness. In relation to climate change, there is an absence of coordinated planning strategy. Although numerous plans exist, none adequately factor in the implications of climate change. The absence of comprehensive coordination and strategic implementation undermines the capacity of such plans to benefit both the tourism sector and the wider economy. The lack of climate policy in the context of tourism could erode investor confidence and hinder the enhancement of overall tourism quality within the country.
		There is a lack of specific climate adaptation policy guidance and active/ effective sustainability framework for tourism

		Tourism sector is not properly integrated with others in respect to climate change, and is currently an outlier.
	Data and knowledge base	There is no sectoral planning based on the reliable climate data. Meteorological and hydrological data are insufficient for tourism (as monitoring is not designed to be of direct assistance to the tourism industry planning), and data integration in tourism plans is lacking. Apart from climate data, the tourism planning lacks other data of relevance – such as the sex-disaggregated data for assessing the gender-based vulnerabilities to climate change.
	Infrastructure	Substandard winter sports infrastructure, even at current climate. Upgrading requires high investments.
	Stakeholder capacities	Very limited technical, financial and human resources and capacity at all levels within the sector to address climate change adaptation.
		There is a significant reliance on informal and unregistered employment, resulting in an untrained workforce with high turnover rates. This limited the possibilities for promoting awareness and building capacity related to climate change adaptation.
		Tourism sectors lack liaison/ coordination with the scientific and research (including meteorology) community that could provide it with data and solutions. The scientific/research community, although competent, either fails to recognize the importance of relationship with tourist sector, or lack incentives to make this area a subject for research.
		There are increasing efforts towards sustainability in the sector – the tourism industry is demonstrating its commitment to a sustainable future through introducing environmentally friendly practices and achieving many international green awards.