

Title: NATIONAL BACKGROUND REPORT ON ENVIRONMENT FOR BOSNIA AND HERZEGOVINA

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Executive Summary

Bosnia and Herzegovina (B&H) occupies an area of 51,129 km². In geographic terms it belongs in the Western Balkans. Hydrologic system is very rich and is divided into two large river basins: Black Sea and the Adriatic. Relief is very dynamic. In the north the country is dominated by plains. In the middle of the mountains as high as 2387 m (Mount Maglić). The climate is very diverse. In the south of the Mediterranean and sub-Mediterranean with hot and long summers and mild rainy winters. In the central part of the moderate-continental and mountain climate, north of the country has a continental climate.

In terms of geological rocks dominate different geographical age -Peleozoik, Mezozik and Kenozoik. A special form has been built against the carbonate rocks. In the central part of the country are old volcanic rocks, and lesser silicious rocks. The soils are very diverse. In the Mediterranean, the red soil, and in middle part dominated by shallow and medium deep soil carbonate. In the lowland areas of the deep soil, and about 12% of wetland soils.

Biodiversity is very rich. Flora of more than 7000 species, 600 species of chordata and an extremely large number of invertebrates. Fungi and lichen has about 1600 species. In terms of biogeography there are three regions: Mediterranean, Euro-Siberian-Boreoamerican and Alpes-High-Nordic. Dominated deciduous forests and in mountainous areas of coniferous forest. Above the upper timberline is high mountain tundra. Forests and forest land occupy about 50% of the area, and the rest of the agricultural and development land. B&H has about 4 200 000 inhabitants. Main demographic centers are Sarajevo, Zenica, Tuzla, Mostar, Bajnja Luka and Bihac. During the war the majority of the village was moved to large cities. In the period before the war, BiH was the industrial and agricultural state. Today in the intensive phase of transition in which the place has a negative environment. Another problem is the hydro-energy sector, where the last oasis biodiversity you want to convert to artificial reservoirs.

In the circumstances the position of the environment in the political system of Bosnia and Herzegovina is specific. It is mainly the responsibility of the entity. International politics is at the state level. Mitigating circumstance is the existence of legislation. However, it should synchronize with the EU documents. BiH is the signatory of many international conventions, protocols and agreements. In the past period of post Dayton Bosnia and Herzegovina has also NEAP at the state level, and on the protection Strategieju biodiverziteti. It is intensively involved in the climate change.

Bosnia and Herzegovina need urgent environmentalization of economy and society. B&H needs a strategy for sustainable development. Therefore it is necessary rapid integration into the EU programs. A particular priority is the establishment of protected areas. The intention is to protect about 20% of national territory (now protected for less than 3%). Due to the complex socio-economic and political conditions do not exist many databases on the basis that they may appreciate the situation and trends in environment. Research projects in the capacity of the environment are low. It is therefore very important upostava national environmental programs, strengthening the scientific and research infrastructure and increasing quality and educated staff. B&H environment, we still have a number of comparative values of importance not only for B&H but also for Europe as a whole.

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Introduction

1. Purpose of the national background report and methodology/summary of the consultation process

2. The Environment S&T system in the Bosnia and Herzegovina

2.1. The Bosnia and Herzegovina and Environment policy framework

Bosnia and Herzegovina (B&H) has the total surface of 51.129 km², and according to its geographical position in the Balkan Peninsula it belongs to the Adriatic basin and Black Sea basin. Therefore, Bosnia and Herzegovina belongs to the Danubean countries group, as well to the Mediterranean countries. In accordance with the Dayton Peace Agreement (DPA) from 1995, the State of Bosnia and Herzegovina (B&H) is administratively divided into two parts, i.e. the two autonomous entities: the Republic of Srpska (RS) and the Federation of Bosnia and Herzegovina (FB&H). In addition, a separate District Brcko was established within Bosnia and Herzegovina's borders. Federation of B&H is made up of 10 cantons. Each canton has its own government and relevant ministries, parliament and government institutions that deal with space management, natural resources and environment.

2.1.1. The overall Environment policy framework

The Government of Bosnia and Herzegovina is a party to a number of international environmental agreements and conventions, and is fully committed to meeting the requirements stipulated in these agreements. Among the most important international agreements ratified is United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, United Nations Convention on Biological Diversity, United Nations Convention to Combat Desertification, Convention on Long-range Trans-boundary Air Pollution and Protocol to the Convention Financing of the Co-operative Program for Monitoring and Evaluation on the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol), Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer, etc.

In accordance with the Dayton Peace Agreement (DPA) from 1995, the State of Bosnia and Herzegovina (BiH) is administratively divided into two parts, i.e. the two autonomous entities: the Republic of Srpska (RS) and the Federation of Bosnia and Herzegovina (FBiH) were established within Bosnia and Herzegovina's borders. In accordance with DPA, each Entity is responsible for the protection, preservation and promotion of the environment; therefore, the two Entity's laws, which cover different environmental issues are in force. In addition, a special set of laws was developed in the Brcko District. So, for the time being in force are the following sets:

| Federation B&H | Republic of Srpska | Brčko District |
|-------------------------------|-------------------------------|-------------------------------------|
| Law on nature protection | Law on nature protection | Law on nature protection |
| Law on environment protection | Law on environment protection | Frame law on environment protection |
| Law on air protection | Law on air protection | Law on air protection |
| Law on water protection | Law on water protection | Law on water |

| | | |
|--|--|---------------------------|
| | | protection |
| Law on waste management | Law on waste management | Law on waste management |
| Law on Fund for environment protection | Law on Fund for environment protection | Law on comunal activities |

The strategic goal of Bosnia and Herzegovina is a full membership to the European Union; therefore both Entities have recognized European and world legislative standards as a basis for developing national environmental legislation.

The Ministry of Physical Planning, Civil Engineering and Ecology of the Republic of Srpska and the Federal Ministry of Environment of the Federation of Bosnia and Herzegovina are responsible for the management of the environment and should provide legislation and administrative management bases for implementation of international conventions, such as UNCBD, UNFCCC and Kyoto Protocol.

Since 2002, Bosnia and Herzegovina has been a Party of the Convention on biodiversity. NFP for the implementation of the Convention is Federal Ministry of tourism and environment. Being an operational body, the Ministry is responsible for the communication with international institutions, initiating of activities considered by the Convention and co-ordination with other relevant authorities and stakeholders.

On the other hand, the Ministry of Urban Planning, Construction and Ecology of RS are the NFP for the implementation of UNFCCC.

2.1.2 The elements of Environment research policy making

2.1.2.1. Federal Environmental Protection Strategy

In accordance with the Law on Environmental Protection, Federal Ministry of Environment and Tourism is responsible for the preparation of the Federal Environmental Protection Strategy, which relates to a period of ten years. The responsible ministry has selected the consultants in December 2006 agreement on the above-mentioned document. Strategy by the law has to be adopted by the Federal Government and the Parliament of FB&H. The components of the Federal Environmental Protection Strategy are:

- A federal strategy of nature protection;
- A federal air strategy;
- Federal waste management strategies;
- Federal water protection strategies, i.e., water resources management which will be separated Strategy.

Strategy process included the following components:

- 1 Determining the vision, principles and guidelines
- 2 Identification of the state of environment
- 3 Defining the goals and measures
- 4 Ranking of priorities

Strategy and its later implementation depend on the degree and modes of key stakeholder's involvement in the process of decision-making, to ensure the integration of its goals and measures and other sector strategies. The public was involved in the entire process of preparing the Strategy to be motivated all stakeholders to actively participate in development and decision-making.

2.1.2.2. Republic of Srpska environmental Protection

- National strategies that exist or that are being prepared/planned
- Strategies that have been done or are in preparation for the Republic of Srpska:
- The Republican strategy to protect air quality management action plan for air
- The Republican strategy of nature protection
- The Republican strategy of environmental protection

2.1.2.3. National Biodiversity Strategy

A highly complex document of *Strategy of Bosnia and Herzegovina and Action Plan for Biodiversity and Landscape's Protection (2008-2015)* contains up to date and complete assessment of state and level of biodiversity, geographic distribution of bioresources, as well as the identified both current and potential negative tendencies.

The document is drafted in the way that it integrates all sectors at local level and enables development of functional connections with international bodies. Hence, in the document are recognizable attributes of national strategy and those of document which is important on regional and global scale.

NBSAP of B&H represents pragmatically reading and guide to all parties involved in the process of planning and decision making. It is an instruction how to, in easier way, gains and understand information in the education system. It is also a component in the process of strengthening and democratization of both public and ecologic awareness.

NBSAP B&H is completed with entire diversity of cultures and cultural heritage of Bosnia and Herzegovina and therefore shall make contribution to the promotion of natural and traditional values of this area, as well as to the promotion of Bosnia and Herzegovina and its natural beauties at the international scale.

NBSAP of B&H identified three strategic mainstreams in the field of nature management:

- A. Decrease of biodiversity loss in B&H
- B. Set up of conservation system and sustainable use of biodiversity in B&H
- C. Decrease of pressures on biodiversity in B&H

2.2. Overview of Environment research activities

2.2.1. Environment research projects of FB&H

- Strengthening of diffuse pollution control in the Federation of Bosnia and Herzegovina
- Development of instrumental framework for Environmental Management of acceptable waste oils
- WWF project-Living Neretva
- Protection of biodiversity in Sava catchment area Dinaric eco-region
- Protection of forests and mountains biodiversity
- Valorization of Ambiental Tourism in Southeastern Europe
- The Protocol on shared tourist valorization of Neretva valley

- Strategic plan for tourism development of the Neretva valley
- Establishment of Emerald network in Bosnia and Herzegovina
- Neretva and Trebisnjica Management Project
- Development of the National Biosafety Framework of B&H
- Environmental Framework and Management Plan for B & H
- Europe's Living Heart

2.2.2. Environment research projects of RS

- Thematic projects in the realization of the Ministry of Science and Technology
- **The impact of climate change on the environment and sustainable development of the Republic of Srpska**, Government of Republika Srpska, Ministry of Science and Technology, University of Banja Luka, Faculty Natural of Science.
- **Renewable electricity**, Government of Republika Srpska, Ministry of Science and Technology, Academy of Sciences and Arts RS and University of Banja Luka, Faculty of Electrical Engineering.
- **Preservation and sustainable usage of genetic resources of the Republic of Srpska**, Government of Republika Srpska, Ministry of Science and Technology, University of Banja Luka, Institute of genetic resources
- **“Study for climate change impact assessment on agriculture and adaptations strategy development in Bosnia and Herzegovina”**, Project implemented by the Regional Environmental Center
- „ **Forest and Mountain protected areas project“?**

2.2.3. Key competencies in Environment research fields

2.2.3.1. In Federation of B&H:

- Academy of Sciences of Arts of B&H
- Government of Federation of Bosnia and Herzegovina
- Federal Ministry for Tourism and Environment
- University of Sarajevo
- Faculty of Science University of Sarajevo
- Center for Ecology and Natural Resources, Sarajevo
- Hydro Technological Institute, Sarajevo

2.2.3.2. In Republic of Srpska:

- Government of Republika Srpska, Ministry of Science and Technology;
- Ministry of Physical Planning, Construction and Environment;
- University of Banja Luka
- University of Eastern Sarajevo
- Fund for Environmental Protection of the Republic of Srpska
- Hydrometeorological Service of Republic of Srpska , Banja Luka
- Institute of Protection, Ecology and Informatics

2.2.4. Environment research infrastructure

2.2.4.1. In Federation of B&H

The most important relevant institutions (political, administrative, higher education, public/private research institutions):

- Academy of Sciences and Arts of Bosnia and Herzegovina
- Center of Carstology of ANUBIH
- Ministry of Foreign Trade and Economic Relations of B&H ([Sector for Natural Resources, Energy and Environment Protection](#))
- Ministry of Civil Affairs of B&H
- Government of Federation of Bosnia and Herzegovina
- Government of Brcko District
- Federal Ministry for Tourism and Environment
- Federal Ministry for Education and Science
- Federal Ministry of Agriculture, Forestry and Water management
- Federal Ministry of Physical Planning
- Federal Ministry of Culture and Sport
- Federal Ministry of Energy, Mining and Industry
- Unsko-sanski Canton
- Ministry of Education, Science, Culture and Sport
- Ministry of Construction, physical Planning and environmental Protection
- Ministry of Agriculture, Forestry and Water management
- Posavski Canton
- Ministry of Education, Culture and Sport
- Ministry of Agriculture, Water management and Forestry
- Ministry of Economy and physical Planning
- Tuzlanski Canton
- Ministry of Education, Culture and Sport
- Ministry of Agriculture, Water management and Forestry
- Ministry of Economy and physical Planning
- Zenicko-dobojski Canton
- Ministry of Agriculture, Water management and Forestry
- Ministry of Education, Culture and Sport
- Ministry for physical Planning, Traffic and Communication and environmental Protection
- Bosansko-podrinjski Canton
- Ministry for Urbanism, physical Planning and environmental Protection
- Ministry of Education, Culture and Sport
- Srednjobosanski Canton
- Ministry of physical Planning and Economy
- Ministry of Education, Science and Sport
- Ministry of Forestry, Water management and Agriculture
- Hercegovacko-neretvanski Canton
- Ministry of Education, Science, Culture and Sport
- Ministry of Construction and physical Planning
- Ministry of Agriculture, Forestry and Water management
- Sarajevo Canton
- Ministry of physical Planning and Environment
- Ministry of Education and Science
- Ministry of Culture and Sport
- University of Sarajevo
- Faculty of Science, University of Sarajevo

- Center for ecology and natural resources
- Land Museum of BiH
- Faculty of Forestry, University of Sarajevo
- Faculty of Medicine University of Sarajevo
- Faculty for Public Health University of Sarajevo
- Faculty of Pharmacy University of Sarajevo
- Faculty of veterinary
- Faculty of Architecture
- Faculty of Political Science
- Faculty for Economy
- Faculty for Traffic and Communications
- Hydro Engineering Institute, Sarajevo
- Hydro Meteorological Institute of FBiH
- Federal Institute for agropedology, Sarajevo
- Faculty of Agronomy, University of Sarajevo
- Faculty of agronomy, University of Mostar
- Faculty of Mechanical Engineering University of Mostar
- Faculty of Mechanical Engineering University of Sarajevo
- Faculty of Science and Education, University of Mostar
- REC Country Office Bosnia and Herzegovina
- Institute for Genetic Engineering
- University of Sarajevo,
- Faculty of Technology University of Tuzla
- Faculty of Mining , Geology and Construction Engineering
- Faculty of Metallurgy and Materials University of Zenica
- Faculty of Mechanical Engineering University of Zenica
- Faculty of Medicine University of Tuzla
- Faculty of Science, University of Tuzla
- Biotechnical faculty University of Bihać
- Faculty of Education University of Bihac
- Water Agency of Sava Catchment Area
- Water Agency of Adriatic Catchment Area

2.2.4.2. In Republic of Srpska

- most important relevant institutions (political, administrative, higher education, public/private research institutions)

- Government of Republic of Srpska, Ministry of Physical Planning, Construction and Environment
- Government of Republic of Srpska, Ministry of Science and Technology University of Banja Luka
- Faculty of Natural Science, Banja Luka
- Fund for Environmental Protection of the Republic of Srpska
- The Agriculture Institute of Republic of Srpska, Banja Luka
- Hydrometeorological Service of Republic of Srpska , Banja Luka
- Institute of Protection, Ecology and Informatics
- REC Country Office Bosnia and Herzegovina and REC Field office Banja Luka
- Center for Environmental and Spatial planning, Banja Luka
- University of Banja Luka, Institute of genetic resources
- University of Banja Luka, Faculty of Technology
- University of Banja Luka, Faculty of Mechanical Engineering
- University of Banja Luka, Faculty of Forestry

2.3. Key drivers of Environment research

2.3.1. In Federation of B&H

1. Institutional framework

- (a) International rules and legal framework of Bosnia and Herzegovina for the maintenance and protection of the biological and landscape's diversity;
- (b) Institutions of the governmental sector;
- (c) Institutions for study, inventory and conservation of the biodiversity;
- (d) Non-governmental organisations.

2. The state of environment of B&H

3. Environmental problems in B&H

4. EU initiatives

2.3.2. In Republic of Srpska

Key governmental and academic institutions participating in the environmental issues include the following: the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina; The Ministry of Physical Planning, Civil Engineering and Ecology of the Republic of Srpska; The Federal Ministry of Environment and Tourism of the Federation of Bosnia and Herzegovina; The Regional Environmental Centre B&H; The Ministry of Science and Technology of the Republic of Srpska; The Ministry of Agriculture of the Republic of Srpska; The Republic Hydro-Meteorological Institute of the Republic Srpska; The Federal Hydro meteorological Institute of the Federation of Bosnia and Herzegovina; The University of Banja Luka: The Faculty of Natural Science, Forestry, Agronomy, etc. of the Republic Srpska, The Faculty of natural Science, Agronomy, etc. of the University of Sarajevo, the Federation of Bosnia and Herzegovina.

2.3.3. Main Environment sector trends in Bosnia & Herzegovina

- Climate Changes monitoring
- Biodiversity assessment & management

- Water resources management
- Development of sustainable tourism
- Establishment of the network of protected areas
- Development of the model for sustainable waste management
- Development of Environmental Impact Assessment process
- Establishment and functioning of fund for environmental protection
- Development of the sector for cooperation with non-governmental organizations

2.3.4. Main socio-economic challenges in [country]

- Lack of instruments for implementation of sustainable policy
- Unfavorable economic situation in the country
- The global economic crisis
- Unfavorable social situation in the country
- Transition of economy and society
- Privatization in natural sector
- Intensive migration from rural to urban area

3. Integration of Bosnia & Herzegovina in the European Research Area in the field of Environment

Bosnia and Herzegovina is the circumstances involved in weak European Research Area. Because of the lack of public fund for environmental research are reduced to a minimum. Except for projects such as the NEAP, Strategy biodiversity protection, etc., which is financed by the World Bank and UNEP, significant projects at the national level was not. B &H has a great need for inclusion in the EU integration projects. There is significant interest, and initial infrastructure and skilled human resources.

4. SWOT analysis of the [Theme] research capacity in [country]

4.1. Strengths

- Favorable level of existing scientific knowledge and experience
- Willingness to accept the new scientific trends
- Easy communication

4.2. Weaknesses

- Dismissing of key research institutions, mechanisms and infrastructure
- Lack of state's interest and strategy for environmental protection;
- Intensive transition;
- Inadequate development strategy;
- Undeveloped mechanisms for making a gain through protection of natural units and lack of financial means for conservation value's research purposes;
- Inadequate position of biodiversity issue within planning process;
- weak possibility for inclusion in major international research projects;
- The Bosnia and Herzegovina's Initial national communication is not implemented;
- Weak national capacity for comprehensive quantitative and qualitative Vulnerability and Adaptation (V&A) assessment, which should be put in broader socio- economic context to arrive at cost-effective adaptation measures;

- Poor data on adaptation options and lack of mechanisms for information sharing and management across sectors;
- Limited awareness of stakeholders and population on climate change adaptation;
- Insufficient and limited funding for adaptation study;
- Priority on setting up a national strategy for adaptation to climate change and comprehensive implementation plans for adaptation. Within the BiH Initial National Communication (INC) should be assessed vulnerability and identified adaptation measures as well as developed the “ Policy Framework for implementing adaptation measures”;
- Improving early warning and response systems;
- Developing and transferring of adaptation technologies;
- Incoherence and lack of harmonisation of strategic and development-related documents (in the sector of forestry, agriculture and water management) with the field of managing the biodiversity;
- Lack of defined social-related researches, with the aim to resolving current problems in the field of biodiversity and implementation of relevant international conventions and directives;
- Very low public awareness of the importance of biological diversity for the purpose of preserving fundamental values of the environment, and especially in regulating climate changes;
- Extremely low number of scientists and experts, as well as of institutions dealing with biodiversity and its maintainance;
- Lack of financial means and funds for scientific research in the field of climate change and biodiversity, as well as the environment as a whole;

4.3. Opportunities

- Adopting and implementation of *Strategy of Bosnia and Herzegovina and Action Plan for Biodiversity and Landscape's Protection (2008-2015)* on national level
- Capacity Building of Bosnia and Herzegovina to deal with environmental issues and fulfillment of the commitments related to the preparation of the National Communication
- Creation of the national inventory system and estimates of changes of environmental components;
- Initiation of the projects with financial support of the GEF in the environment focal area,
- Collecting the necessary data and information and work
- Preparation of the National Climate Action Plan for Bosnia and Herzegovina;
- Enhancing the cooperation with bodies of UNCBD, UNFCCC, Kyoto Protocol, Intergovernmental panel for climate changes (IPCC) and GEF;
- Initiation of the national Program and projects for capacity building under the Program of the World Meteorological Organization, in the fields of climate monitoring and climate extreme detection, early warning and forecasting, as well as climate database construction and management, using advanced methods and technologies;
- Initiation of the projects on synergy activities for the implementation of the UN Convention related to climate change, biodiversity and desertification.
- Development and implementation of methods for local climate change scenario;
- Development and implementation of methods for assessment of impacts, sensitivity and vulnerability to climate change;
- Development and implementation of methods for climate change risk assessment;

- Development of methods and measures for adaptation to climate change.
- Moving agro climate zones to north and higher height above sea level.
- Actions might include the following Specific needs:
- Financial assistance for technological capacity building in the fields of systematic climate observation, data collection, processing, archiving, climate database development and climate change analysis and forecasting (meteorological, hydrological and other relevant instruments and equipments, hardware and software, etc.);
- Financial assistance for staff to take advantage of UNCBD, UNFCCC, IPCC, WMO, GCOS and other international institutions training opportunities related to: biodiversity, climate change impacts studies and projections, vulnerability, adaptations and mitigation assessment; national GHG emission inventory preparation and reporting;
- Financial assistance for Project “Capacity building for adaptation to climate change in Bosnia and Herzegovina across sectors”;
- Enhance awareness and knowledge on climate changes, their possible impacts, and other related climate change issues in B&H;
- Support participation of stakeholders - Strengthen relevant and key research institutions and NGOs;
- Implementation of the First National Report on Climate Change (INC), and within its framework, determining of an impact of climate changes on the biodiversity, as well as measures for the adaptation;
- Setting a framework which defines long-term activities as regarding solution of the problems related to climate changes;
- Setting a framework for the adoption of a national strategy of adaptation to climate changes, and an overall plan for the adaptation;
- Defining of measures and activities for alleviating an impact of global climate changes on biodiversity and ecosystems in BiH;
- Improvement of knowledge about global climate changes, especially about the anthropogenic impacts on global changes, and their potential impact on the biodiversity of BiH;
- Develop and conduct a sensitivity and vulnerability analysis of ecosystems (including
 - agro-ecosystems), habitats to projected climate change;
- Develop a monitoring and adaptive measures recommendation for conservation and restoration;
- Evaluate existing ambient monitoring program to determine whether additional biodiversity monitoring will be needed as new climate change information emerges;
- Development of scientific tools to evaluate the effects of climate change on local fish
 - and wildlife populations and habitats;
- Analysis of the vulnerability of forest resources to climate change (special attention will be paid to understanding and developing management practices to reduce risk of forest fires and insect disturbance, to the extent possible);
- Extensive educational assistance to small land owners, increased ability to fire management planning, and sound management of public lands;
- Develop climate-impacted database and products on emerging forest practices (e.g. reforestation techniques and pest management) that are considered most adaptive to

- climate change, as well as information on how to reduce risks of forest fires and
- insect disturbance;
- Provide outreach and update the stakeholders from SEE region and national adaption teams with relevant information through appropriate seminars and workshops and various media sources about the impact of climate change to forest health and forest;

4.4. Threats:

- Habitats conversion
- Unsustainable use of resources
- Logging, hunt and poaching
- Permanent pollution of all environmental spheres
- Devastation and destruction of ecosystems
- Degradation and fragmentation of ecosystems
- Disturbance in wilderness
- Unsustainable gathering of economically important species
- Uncontrolled use of pesticides and fertilisers
- Uncontrolled introduction of alien species
- Uncontrolled introduction and manipulation with GMOs
- Construction of full infrastructure :
- Construction of traffic network;
- Construction of power facilities (hydro-accumulation, power plants, power transmission, pipelines, gaslines etc.);
- Construction of water supply facilities (catchment areas, trenches, dam lakes, retentions, dams);
- Agricultural activities (melioration, replotting, exhausting of habitats by monoculture, use of pesticides and fertilisers);
- Uncontrolled urbanisation and ruralisation;
- Disharmony between development goals by sectors;
- Increased pressure on water resources;
- Increasing risk of climate extreme, particularly storms, floods, erosions, landslides, losing a swamp soil, and also dryness and land degradation;
- Declining of soil quality;
- Changes in eco-systems followed with positional losing some species;
- Declining productivity of forests in South Europe;
- Increasing the danger of sylvan fire, particularly in the Area of South Europe and Adriatic;
- In some parts of Bosnia and Herzegovina agriculture could be directly endangered by climate changes because of increasing the water pressure.

5. Environment research priorities for Bosnia & Herzegovina

- Identification and classification of both ecosystem and habitat types
- Estimation of natural values in endemic development centers of narrow passages and canyons of Neretva, Una, Sana, Vrbas, Bosna and Drina river including their tributaries
- Estimation of natural values in wetland landscapes of B&H
- Inventory of Flora, Fauna and Fungia of Bosnia and Herzegovina
- Red list and Book of plants, animals and fungia of Bosnia and Herzegovina
- Setting up of gene bank for endemic and threatened gene pool
- Creation of Action Plan for conservation of herbal genetic resources in B&H under *in situ* conditions

- Preparation of instructions for identification of ecological values within B&H's regions
- Development of integrated environmental management process
- Capacity building needed for implementation of ecosystem approach in nature management
- Identification of sensitive areas and ecosystems in Bosnia and Herzegovina

- Climate changes - Establishing Early Warning Systems due to the harmful effects of weather variables
 - on human health,
 - Strengthening of capacities on the national and local level (education, awareness raising
 - and the creation of legal frameworks, institutions and an environment that enables people to
 - Take well-informed decisions for the long-term benefit of their society).
 - Share the lesson learnt for the connections between the water issues and land-use planning,
 - in particular in relation to flood risk management;
 - Development of a database of extremes (droughts and floods) and Establishment of an Early
 - Warning System for floods and droughts;
 - Incorporate climate change adaptation measures into relevant national strategic and planning
 - documents;
 - Training and equipment for national/local water management organizations and operators;
 - Enlargement and modernization of the existing network of meteorological and hydrological
 - stations, including ground water monitoring system (quality and quantity);
 - -Strengthening of the capacities of the National Hydro meteorological Services, particularly
 - their observation networks, telecommunications, processing, forecasting and early warning
 - systems;
 - Research on the impact of climate change on planting dates and cultivars;
 - Research on the impact of climate change on crop and forest yields, pests and diseases;
 - Research on the impact of climate change on the effects of extreme events, such as forest
 - fires, on agriculture and forestry directly and on the market for agricultural and forestry products,
 - etc.;
 - Development of a database of droughts and forest fires and risk mapping;
 - Identification and development of adaptation measures and techniques to combat the negative
 - Effects of climate change on agricultural production and forestry.
 - Development of adaptation programs on climate change in forestry sector;
 - Preparation of basic regional maps of in GIS format (soil, vegetation, erosion, drought and
 - forest fire risk map, etc);

- Risk and vulnerability assessments for regions;
- Development of regional and local climate information services tailored to the tourism sector
- And promote their use among tourism stakeholders. Build capacities for interpretation and application of this information;
- Evaluation of the impacts of sea level rise on ground water and water availability;
- Evaluation of the impacts of climate change on fisheries, as well as other marine species;
- Research on the impact of climate change and extreme weather events on species survival;
- Research on the impact of climate change on changes in habitat, composition and structure, including the expected increase in invasive species and diseases;
- Research on the impact of climate change on changes in seasonal timings that will affect the dependencies and reproductive success of species;
- Research on the impact of climate change on land use, such as agriculture, water, and forestry, on biodiversity;
- Development of scientific tools to evaluate the effects of climate change on local fish and wildlife populations and habitats;
- Risk and vulnerability assessments for protected areas in the B&H;
- Enlargement and modernization of the existing network for monitoring the status of biodiversity components through monitoring of the phenology of bioindicator species;
- Enlargement and modernization of the existing network of mountain meteorological stations with vertical and slope distribution for biodiversity vulnerability assessment.

5.1. [Theme] Research priorities on the basis of the country's readiness*

5.1.1. Priority 1 (incl. explanation and if possible give further specification for sub-Theme, area, activity...)

Climate change – reflection on environment and economy,

5.1.2. Priority 2

Biodiversity and Ecosystems Management

5.1.3. Priority 3

Water Resources Management

5.1.3. Priority 4

Land use

5.2. [*Theme*] Research priorities on the basis of future potential**

5.2.1. Priority 1

Water Resources in Hydro Energy and Climate Changes

5.2.2. Priority 2

Biodiversity in Global Climate Changes

5.2.3. Priority 3

Energy in Climate Changes

5.2.4. Priority 4

Biodiversity and Natural Resources in Sustainable Economy

Annex I. Classification of the [*Theme*] research fields

* Definition: **Readiness**: priorities for which the country has the appropriate human resources and research infrastructures in order to pursue research and development

** **Potential**: priorities that are considered attractive for the country and have future potential. However, the level of readiness and capacity to pursue.