BiH WATER AND SANITATION SERVICES
MODERNIZATION PROJECT

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR FEDERATION OF BOSNIA AND HERZEGOVINA

December 2020

Table of Contents

List of Tables

List of Figures

Abbreviations

BD	Brcko District
BiH	Bosnia and Herzegovina
BPM	Biodiversity Management Plan
CSOP	Construction Site Organization Plan
E&S	Environmental and Social
EEA	European Environmental Agency
EIA	Environmental Impact Assessment
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMAP	Energy Sector Management Assistance Program
ESMP	Environmental and Social Management Plan
ESSs	Environmental and Social Standards
EU	European Union
FBiH	Federation of Bosnia and Herzegovina
FMAWMF	Federal Ministry of Agriculture, Water Management and Forestry
FMET	Federal Ministry of Environment and Tourism
GIS	Global Information System
ICPDR	The International Commission for the Protection of the Danube River
KBA	Key Biodiversity Area
LEAP	Local Environmental Action Plan
LG	Local Government
LMP	Labor Management Procedure
M&E	Monitoring and Evaluation
MoFTER	Ministry of Foreign Trade and Economic Relations
MPPCEE	Ministry of Physical Planning, Civil Engineering and Ecology
OHS	Occupational Health and Safety
OP	Operational Procedure
PIU	Project Implementation Unit
PSA	Public Service Agreements
RP	Resettlement Plan
RPF	Resettlement Process Framework
RS	Republic of Srpska
SCADA	Supervisory Control and Data Acquisition
SEP	Stakeholder Engagement Plan
ToR	Terms of Reference
WB	World Bank
WFD	Water Framework Directive
WSS	Water Supply and Sanitation
WSSM	BiH Water and Sanitation Services Modernization Project
WWTP	Waste Water Treatment Plant
WU	Water Utility Companies

1 EXECUTIVE SUMMARY

Project background

The Development Objective of the Project is to support the government of Bosnia and Herzegovina (BiH) to (i) strengthen the enabling environment at Entity and Municipal level for improved service delivery and thus customer satisfaction; and (ii) improve access to safely managed WSS services, and (iii) improve the efficiency of WSS service providers in participating local governments.

This project will implement a series of subprojects with high relevance to the program objectives. The first phase will target an initial number of utilities in terms of technical assistance and eligible investments. The second phase will help consolidate capacity building, reform actions and investment in the phase one utilities while allowing for scale-up of project activities in other Local Governments (LGs) and Water Utilities (WSs) across BiH.

The project consists of three components and accompanying activities as described below:

Component	*Sub-component/ Activities*
Component 1: improving the enabling environment for sector modernization	Sub-component 1.1: Support for water supply and sewerage sector reforms on Entity level
	Technical assistance activities: - development of a WSS sector financing mechanism - institutionalization of a utility benchmarking system - development of a rural WSS data base; - national capacity building program for the professionalization of the sector
	Sub-component 1.2: Project management and coordination of the sector reforms
	Financing of PIU to perform project management-related activities: - audits, training, safeguards and fiduciary management, and all associated Project operating costs - managing beneficiary satisfaction surveys and feedback mechanism, including a grievance redress mechanism, - financial and technical support to line ministries and established Entity Working Groups - technical advice for the formulation of regulatory and policy frameworks, policy facilitation and public consultations
Component 2: Support for water services sector reforms at local level	Technical assistance activities: - The preparation of water utility business plans (BP) - Development and signing of Public Service Agreements (PSAs) between the municipality and the water utilities - Preparation of tariff proposal, based on legislation set on Entity level - Support for organizational restructuring - Capacity building on technical, commercial and financial topics
Component 3: Improving access to safely managed WSS services and the efficiency of WSS service providers	Infrastructure investments for improving access, quality and efficiency of WSS service delivery including, but not limited to: - Water efficiency investments including NRW reduction (such as leak repair, pressure control, etc.), energy efficiency measures and metering & commercial systems - Water assets renewal and extension, other water components including water system rehabilitation and extension, Water Treatment Plant (WTP) rehabilitation and construction, SCADA, GIS, other measures - Wastewater assets renewal and extension including sewer network rehabilitation and extension, improvements to existing Waste Water Treatment Plants (WWTPs) - New WWTPs construction

The existing Project Implementation Unit (PIU) within FBiH Ministry of Agriculture, Water Management and Forestry will be responsible for implementation of the activities in FBiH. Water Agencies for Sava and Adriatic basin will provide technical support. In each municipality, the Project Implementation Team (PIT) shall be established which should consist of representatives from Municipality/City and Water Utility. Also, the PIT will carry out daily coordination of the activities and regularly report to PIU.

The program will be implemented over a period of 6 years.

Environment and social (E&S) risk of the Project is rated substantial due to the potential nature of the sub-projects and the significant impact on the policy and institutional environment.

Objectives of the Environmental and Social Management Framework (ESMF)

Within the *BiH WSS Modernization Project*, the implementation of specific subprojects will be proposed. In order to facilitate the adequate preparation of such sub-projects, the ESMF is used to define and guide the environmental and social (E&S) due diligence mechanisms for specific activities.

All subprojects to be financed under the Program would be subject to assessment of E&S risks following the procedures described in this ESMF. The ESMF establishes principles, rules, guidelines and procedures for assessment of E&S risks and impacts. The E&S assessment will be based on current information, environmental and social data at the appropriate level with an accurate description and assessment of the project and any associated aspects. As a result, relevant environmental and social instruments will be prepared and used during implementation of each sub-project. The ESMF refers to new activities as well as to activities for which a retroactive financing is sought.

The relevant ESSs and OPs are:

ESS/OP	
ESS1	Assessment and Management of Environmental and Social Risks and Impacts
ESS2	Labor and Working Conditions
ESS3	Resource Efficiency and Pollution Prevention and Management
ESS4	Community Health and Safety
ESS5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
ESS6	Biodiversity Conservation and Sustainable Management of Living Natural Resources
ESS8	Cultural Heritage
ESS10	Stakeholder Engagement and Information Disclosure
OP 7.50	Projects on international waterways

Environmental and social assessment of subprojects

Step 1. Carry out the rapid risk analysis and E&S assessment pursuant to the WB requirements

Rapid risk assessment of each sub-project will be done based on the two criteria: *project impacts* and *sensitivity of receiving environment*.

The *project impacts* shall be assessed as “high“, “medium“, “low“ and “minor/no impact“ based on the magnitude of the project and scope of works (new construction, rehabilitation and maintenance). Appropriate matrices for water supply and wastewater sub-projects are developed to assess these aspects. The *sensitivity of receiving environment* shall be assessed as “high“, “moderate“ and “low“ taking into account important ecological and sociocultural characteristics in the direct and indirect influence area and using the developed assessment matrix.

Based on the assessment of the two criteria, the category of risk will be assessed as “high“, “substantial“, “moderate“ and “low“ risk and the following actions taken:

Risk category	*Action to be taken*	*Result of the action*
High risk subprojects	High risk activities are not eligible for financing	Reconsider changing the design or siting characteristics and resubmit the sub-project.
Substantial risk subprojects	A preliminary environmental assessment is required to decide whether the project can proceed without a full environmental impact assessment.	WB requirements on E&S impacts mitigation and monitoring included in the tender dossier/bidding documents. Mitigation obligations

Risk category	*Action to be taken*	*Result of the action*
	An assessment will be carried out in line with the entity laws, this ESMP and provisions set forth under ESS1 and any other relevant ESS as well as and the ESF.	assigned to the hired contractor. Monitoring assigned to contractor or supervisor, as relevant.
Moderate risk subprojects	A site-specific ESMP will be produced in line with this ESMF. Sections related to all applicable ESSs shall be included.	WB requirements on E&S impacts mitigation and monitoring included in the tender dossier/bidding documents. Mitigation obligations assigned to the hired contractor. Monitoring assigned to contractor or supervisor, as relevant.
Low risk subprojects	The implementation can start after inclusion of generic ESMP into construction works contract. A generic ESMP has been prepared for the purpose of this project and is provided in Annex C to this ESMF.	WB requirements on E&S impacts mitigation and monitoring included in the tender dossier/bidding documents. Mitigation obligations assigned to the hired contractor. Monitoring assigned to contractor or supervisor, as relevant.

Additionally, PIUs will be required to:

- in case of any land acquisition issues identified, prepare a site-specific Resettlement Plan in line with the guidance given in the Resettlement Framework developed for the WSS Modernization project,
- implement the developed Labor Management Procedure, and update it as necessary,
- undertake stakeholder engagement and disclose appropriate information in accordance with the Stakeholder Engagement Plan developed for the WSS Modernization project,
- conduct monitoring and reporting on the E&S performance of the for the WSS Modernization project against the program-specific ESMF, RPF, SEP and LMP.

Step 2. Carry out an environmental assessment in line with entity regulations

Type of activities	*Action to be taken*	*Result of the action*
WTPs / Water intakes	In case that the activity involves abstraction of water in volume equivalent to or exceeding 3 million cubic meters Environmental Impact Assessment procedure carried out by the ministry of environment and ultimately ending with issuing of environmental permit. Submit the EIA study including the Waste Management Plan. In case that the activity involves abstraction of water in volume of between 1 - 3 million cubic meters Preliminary impact assessment based on which the ministry of environment decides on the necessity to conduct a full EIA and ultimately issues the environmental permit In case that the activity involves abstraction of water in volume of less than 1 million cubic meters Check Cantonal regulations to determine if environmental permitting is needed. If yes, submit the request for environmental permit including Waste Management Plan. *Note: In case the expansion of WTP is greater than 25% seek the opinion of the ministry of environment on the necessary of environmental impact assessment procedure.*	Environmental permit
WWTPs	Capacity > 50.000 Population Equivalent (PE) Environmental Impact	Environmental permit

Type of activities	*Action to be taken*	*Result of the action*
	Assessment procedure carried out by the ministry of environment. Submit the EIA study including the Waste Management Plan. Capacity 10.000-50.000 PE Preliminary impact assessment based on which the ministry of environment decides on the necessity to conduct a full EIA and ultimately issues the environmental permit Capacity <10.000 PE Environmental permitting at cantonal level. Submit the request for environmental permit including Waste Management Plan. *Note: In case the expansion of WWTP is greater than 25% seek the opinion of the entity ministry of environment on the necessary environmental assessment procedure.*	
Pipelines/pump stations/reservoirs	No action needed	-
Other water components (metering, SCADA, GIS, other soft measures)	No action needed	-

Step 3. Organize consultations with stakeholders at the location closest to the project implementation site in line with the requirements of the Stakeholder Engagement Plan (SEP) which has been developed as a separate document under this Project.

Step 4. (*If needed and where applicable*) Obtain various permits and approvals including water management acts and construction related acts.

Step 5. Implementation of mitigation measures/plans

The ESMP shall be integrated in the tender documents and later on in a legal agreement between the Ministry and a Contractor. The contractor shall integrate all mitigation measures from the ESMP and received environmental and water permits in Construction Environmental Management Plan expanded with social aspects to include social mitigation measures.

Step 6. Supervision and reporting

The PIU in cooperation with PITs will review the status of mitigation/ESMPs implementation through direct supervision as well as through contracted supervision engineering authority.

Pursuant to the WB requirements, a Labor Management Procedure (LMP) has been developed as a separate document and should be implemented during the implementation of all subprojects under this Project.

Implementation arrangements

The PIU shall in cooperation with PITs monitor the implementation of this Framework, both at overall Project level and individual subproject level. The PIU will be staffed with an environmental and social specialist as the basic requirement for implementation of the project in line with the World Bank's ESF, relevant ESS and this ESMF. Preparation of technical assistance documents and site-specific ESIA/ESMPs for priority investments will be undertaken by qualified Consulting Companies/Individual Consultants. They will be selected by the PIU following the national tender procedure. The construction works will be carried out by a selected Contractor. The Contractor shall appoint a person with adequate experience for environmental and social protection (B.Sc. environmental engineering or similar) that will be responsible for the implementation of all environmental and social mitigation measures.

The PIUs will report on a regular basis to WB on subproject screening, approval and monitoring results.

Key elements of a budget for ESMF compliance

The total cost for ESMF implementation cannot be estimated as the number of technical assistance activities or sub-projects is unknown. Key elements of the ESMF requiring a cost budget are highlighted and indicative unit costs are shown. These need to be reviewed and revised as necessary.

Public consultations process

TBA

2 INTRODUCTION

2.1 Brief Project Description

2.1.1 Objectives

The Development Objective of the Project is to support the government of Bosnia and Herzegovina (BiH) to:

- Strengthen the enabling environment at Entity and Municipal level for improved service delivery and thus customer satisfaction;
- Improve access to safely managed WSS services, and
- Improve the efficiency of WSS service providers in participating local governments.

2.1.2 Components

This project will implement a series of subprojects with high relevance to the program objectives. The first phase will target an initial number of utilities in terms of technical assistance and eligible investments. The second phase will help consolidate capacity building, reform actions and investment in the phase one utilities while allowing for scale-up of project activities in other Local Governments (LGs) and Water Utilities (WSs) across BiH.

The project consists of three components as described below:

Component 1: Improving the enabling environment for sector modernization

This component will finance activities at the Entity level with the aim of strengthening policy and regulatory frameworks and institutional capacities to advance sector reform and improve operational efficiency and sustainability, as well as resilience of the WSS sector to climate change effects. This project activities will target key stakeholders, including line ministry for water management, LGs and WUs The component is structured around two sub-components:.

Sub-component 1.1: Support for water supply and sewerage sector reforms on Entity level. This sub-component will finance key activities of the reform process in coordination and in alignment with activities supported by other development partners. This sub-component will finance **technical assistance** for the: (i) development of a WSS sector financing mechanism which promotes performance based financing; (ii) institutionalization of a utility benchmarking system for the tracking, analysis and preparation of monitoring reports to assess the performance of water service providers in targeted municipalities; (iii) the development of a rural WSS data base; (iv) launch of a national capacity building program for the professionalization of the sector.

Sub-component 1.2: Project management and coordination of the sector reforms. This sub-component will finance (i) the Project Implementation Units (PIUs) to perform project management-related activities, including monitoring and evaluation (M&E), (ii) Project and entity audits, training, safeguards and fiduciary management, and all associated Project operating costs (iii) beneficiary satisfaction surveys and managing a beneficiary feedback mechanism, including a grievance redress mechanism, (iv) coordination and technical backstopping of the reform process in the mid-term providing financial and technical support to line ministry and established Entity Working Groups; and (v) technical advice for the formulation of regulatory and policy frameworks, policy facilitation and public consultations in cooperation with the UNDP MEG II project.

Component 2: Support for water services sector reforms at local level

This component will finance activities at the municipal levels, which will ultimately contribute to institutional strengthening, building and improving existing capacities.

This component includes the financing activities focused on: (i) Preparation of water utility business plans targeting at improvement and modernization of WSS sector, (ii) Development and signing of Public Service Agreements (PSAs) between the municipality and water utilities, (iii) Preparation of tariff proposal, based on

legislation set on Entity level, (iv) Support for organizational restructuring with the aim of increasing efficiency; (v) Capacity building on technical, commercial and financial topics, as well an in environment and social risk management, including gender-specific areas of skill development.

Component 3: Improving access to safely managed WSS services and the efficiency of WSS service providers

Within this component, activities that contribute to improving access, quality and efficiency of WSS service delivery will be financed. It will finance investments according to the water utilities' performance level classification and the needs identified in their business plans prepared under Component 2. Financing under this component would include two categories: (i) performance and efficiency improvements including but not limited to the implementation of non-revenue water reduction, energy efficiency programs and improvements in metering and commercial systems and (ii) construct, upgrade, and modernize WSS infrastructure, including water treatment and distribution facilities and wastewater collection and treatment facilities.

The works that are envisaged at this stage under this Project include rehabilitation of existing water supply or sewerage networks, pumping stations, water supply plants or wastewater treatment plants. Although the specific locations and cities will be known in phases during implementation, it is safe to assume that the cities targeted will not be larger than 200,000 inhabitants, with the exception of Sarajevo with 500,000 (however with a functional water supply and wastewater treatment plant) and that all of them have existing water supply networks. For the first phase the proposed investments at this stage include: (i) construction of new WWTP (35,000 PE) in Tesanj, (ii) rehabilitation of the existing water tank and main water supply pipe to fix leakages and reduce NRW and energy consumption in Citluk, (iii) rehabilitation of existing transmission mains for NRW reduction and construction of new water distribution system in Gracanica and (iv) extension of the water supply system in the municipality (construction of a water tank and main water supply pipe) in Siroki brijeg, all to be confirmed through further development of the designs.

2.1.3 Risk rating

Environmental and social risk of the Project is rated substantial due to the potential nature of the sub-projects and the significant impact on the policy and institutional environment.

2.1.4 Implementation Arrangements at the Project Level

The existing Project Implementation Unit (PIU) within FBiH Ministry of Agriculture, Water Management and Forestry will be responsible for implementation of the activities in FBiH. Water Agencies for Sava and Adriatic basin will provide technical support. The PIU will be responsible for the implementation of the assigned Entity project activities, carry out procurement and supervision/monitoring of contracts, maintain effective internal control procedures, account for expenditures in their existing budgetary accounting systems, receive funds, make payments and provide the documentation and information related to use of the loan/grant proceeds, statement of expenditures (SOE) documentation of the eligible expenditures, project reporting and monitoring.

In each municipality, the Project Implementation Team (PIT) shall be established which should consist of representatives from Municipality/City and Water Utility. The PIT will prepare documentation needed for tendering procedures and submit to PIU. Also, the PIT will carry out daily coordination of the activities and regularly report to PIU. PIU shall organize needed training to PIT staff in order to strength capacities on local level (including trainings on procurement, financial management and disbursement, financial reporting, monitoring and evaluation, environmental and social safeguards). Details on relations among PIU and PIT will be defined in the Project Operational Manual (POM).

Project Implementation Units in FBiH (PIU) will need to have a clear mandate to coordinate with Entity Intersectoral Working Groups[1] for know-how transfer to the institution upon the end of the Project.

Institutional arrangements related to implementation of this ESMF are detailed in Chapter 8.

2.1.5 Timeline

The program will be implemented over a period of 6 years.

Expected Approval Date is 11 March 2021.

Expected Closing Date is 10 May 2027.

2.2 Objectives of this Environmental and Social Management Framework

According to the World Bank (WB) Environmental and Social Framework of 2018 (Environmental and Social Standard (ESS) 1: Assessment and Management of Environmental and Social Risks and Impacts), the *Environmental and Social Management Framework (ESMF)* is **an instrument that examines the risks and impacts when a project consists of a program and/or series of subprojects, and the risks and impacts cannot be determined until the program or subproject details have been identified.**

Within the *BiH Water and Sanitation Services Modernization Project*, the implementation of specific subprojects will be proposed. In order to facilitate the adequate preparation of such sub-projects, the ESMF is used to define and guide the environmental and social (E&S) due diligence mechanisms for specific activities. The environmental and social assessment will be an adequate, accurate and objective evaluation and presentation of the risks and impacts.

The ESMF establishes principles, rules, guidelines and procedures for assessment of E&S risks and impacts. It includes measures and plans for reduction, mitigation and/or compensation of negative risks and impacts, rules for estimating and budgeting costs of such measures, as well as information on the agency or agencies responsible for addressing project risks and impacts, including information on such body's capacity to manage E&S risks and impacts. It also includes adequate information on the area where a subproject is expected to be implemented, including any potential E&S vulnerability of such area; as well as information on the potential impacts and mitigation measures which could be implemented. The environmental and social assessment will be based on current information, environmental and social data at the appropriate level with an accurate description and assessment of the project and any associated aspects.

This ESMF has been prepared with the aim to ensure:

- project compliance with all relevant local polices and legislation, as well as WB requirements, and therefore
- adequate mitigation of all potentially adverse E&S impacts of the Program.

This document provides a detailed description of the procedures related to assessment, management and monitoring of E&S risks and impacts of the subprojects. All subprojects to be financed under the Project will be subject to an assessment of E&S risks by the PIU, following the procedures described in this Framework. For "high" risk subprojects, an *Environmental and Social Impact Assessment (ESIA)* will be developed, while for

[1] Intersectoral Entity Working Groups to coordinate the reform process have been established with participation of relevant institutions including Entity Ministries, water utility representatives and representatives of local governance.

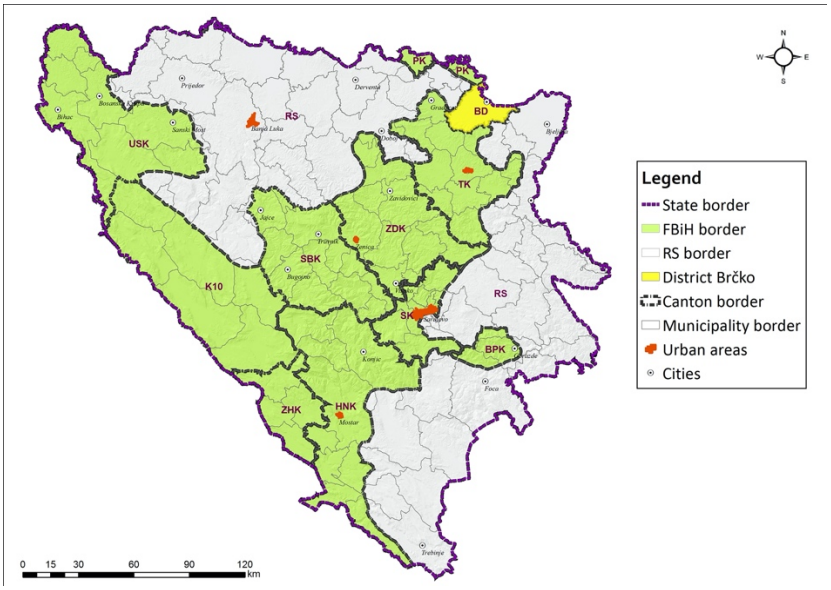
"substantial", "moderate" and "low" risk subprojects, an assessment will be carried out in line with the FBiH environmental laws and will include preparation of a site-specific *Environmental and Social Management Plan (ESMP)*, all in line with this ESMF and provisions set forth under the World Bank ESS1 and ESF.

The ESMF refers to new activities as well as to activities for which a retroactive financing is sought.

2.3 Basic Information About the Project Area

Bosnia and Herzegovina is an independent country with a decentralized political and administrative structure, consisting of two entities: Federation of Bosnia and Herzegovina and Republic of Srpska and Brcko District. This document will analyze the environmental and social impact of the modernization of the water supply and sewerage sector in the Federation of BiH. Therefore, basic information about the project area are given in the table below.

Table 1: Basic information about the project area

Bosnia and Herzegovina	
Abbreviation:	BiH
Capital:	Sarajevo
Area:	51.209 km^2
Population:	3.531.159
Government structure:	BiH is a country with several levels of government: ▪ at BiH level ▪ at the level of entities/District (FBiH, RS and BD) ▪ at the level of Cantons in FBiH only ▪ at the level of municipalities. The highest legislative body in BiH is the Parliamentary Assembly of BiH. Other institutions at the national level are: Presidency of BiH, Council of Ministers of BiH, Constitutional Court.
EU status:	BiH has an EU candidate status. Accession negotiations with the EU are ongoing.
Federation of Bosnia and Herzegovina	
Abbreviation:	FBiH
Major cities or towns:	Sarajevo, Tuzla, Mostar, Zenica, Bihać, Livno
Area:	26.110 km^2
Geographical position:	Federation of Bosnia and Herzegovina is an entity in Bosnia and Herzegovina. Bosnia and Herzegovina borders Croatia, Montenegro and Serbia and the Adriatic Sea.  *Figure 1: Geographical map of FBiH*
Population:	2.219.220
Languages:	Official languages: Bosnian, Serbian and Croatian
Government structure:	In FBiH, the Parliament of FBiH has legislative authority. Entity level institutions include: Parliament of FBiH, Federation's Government, Federation's President with two Vice-Presidents and Federation's Constitutional Court.
Main industries	Coal, steel, iron, vehicles, tobacco, food, clothing, leather, wood, furniture, paper, chemical, pharmaceutical

Nominal GDP:	BAM 23.131 million (2019)
Nominal GDP per capita:	BAM 10.562 (2019)
Nominal GDP growth:	5,2% (2019)
Water Supply and Sanitation Services in FBiH:	Water and sanitation sector in FBiH is in an unenviable position. The weak institutional set-up, incompatibility of tariffs with the principles of cost recovery, the sector's financial challenges, high inefficiencies, weak operations and maintenance practices have caused a reduction in the quality of service delivery to the citizens in FBiH.

3 BASELINE ENVIRONMENTAL CHARACTERISTICS OF THE PROJECT AREA

3.1 Geographic, Topographic and Geological Characterization

Information for this chapter are taken from the *Water Management Strategy of the Federation of Bosnia and Herzegovina (March 2012)*. The FBiH is dominantly mountainous with flat areas situated along larger river banks. Following the direction from North to South, the flat area gradually turns into wide foothills sloping upward from 200 to 600 m a.s.l., progressively turning into a mountainous region. The remaining part of the region is covered with Dinaric Mountains with northwest-southeast bearing. The central part is dominated by mounts composed of noncarbonated rocks, amongst which the following river basins and valleys are situated being proportionally wide – the Sarajevo-Zenica valley and the Tuzla valley. The southwest area is composed of Jurassic and limestone rocks. In the karst zone of Dinarides, at different altitudes, there are karst fields. The hilly eastern area is mostly composed of impermeable rocks. The southern part of the region sloping downwards in cascades to the Adriatic Sea is mostly composed of cretaceous and Jurassic limestone. The upper part is made of Dinaric mountain chains, with karst fields stretched amongst them, while the lower parts are dominated by plateaus, also with karst fields (Ljubusko polje field and Mostarsko polje field). Generally speaking, the area of the Federation of BiH belongs to the category of medium-sized mountain relief.

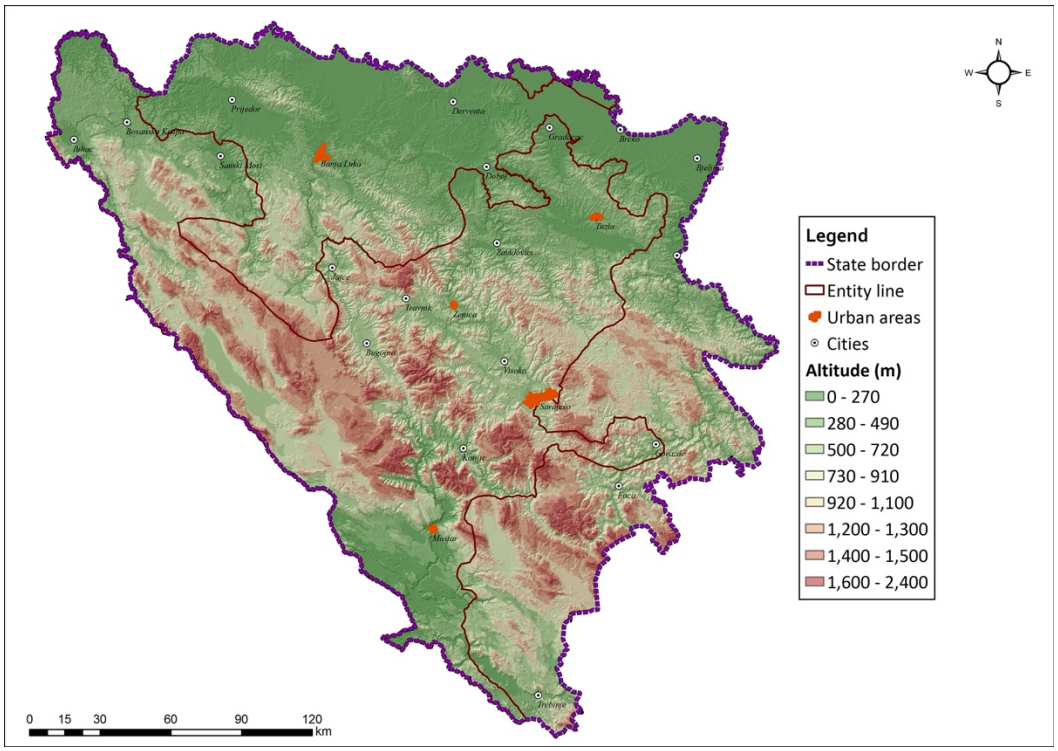


Figure 2: Topographic map of BiH

The largest vertical faults are located around watersheds of the Sava River Basin District and the Adriatic Sea Basin District, while the degree of horizontal faulting is the lowest on the limestone-dolomite substrates. The steepest slopes of the terrain are at gorges and at the transitions to high ridges, while the least steep ones are at the basins and intermountain depressions.

Geological structure and petrographic composition of the terrains in the FBiH are the consequence of a long geological past resulting in creation of magmatic, sedimentary and metamorphic rocks, as well as considerable ore mineralization. The relief has been developing throughout the Palaeozoic, Mesozoic and Cainozoic Eras. The hydrographic outflow properties are significantly influenced by the presence of a well-developed karst zone. The hydrological properties are significantly influenced by geomorphologic and hydro-geological factors. The

precipitation is most intense at the foot of Dinarides, and is linked to the karst zone position, with its large ground hydrological retention potentials. If there had been the same geomorphologic and precipitation-related features, and no karst zone, the water regimen in the Federation of Bosnia and Herzegovina, as well as in Bosnia and Herzegovina as a whole would have been considerably less favorable.

The FBiH rests on several different paleogeographic and structural units that are distinctive by their respective composition, structure and genesis. In southwest- northeast profile, from the Adriatic Sea to the Sava River, the following paleogeographic and structural units may be noticed[2]:

- Adriatic Carbonate Platform (External Dinarides) - mostly covers the catchment area of the Adriatic Sea, and smaller part of the catchment area of the Sava River
- Alochthonus Palaeozoic and Triassic complexes whose smaller part belongs to the catchment area of the Adriatic Sea and larger – the catchment area of the Sava River. The Adriatic Sea basin covers south-west parts of the mountains Zec, Bitovnja and Bjelasnica (Neretva River basin). The Sava River basin covers Palaeozoic and Triassic terrains of the areas of Klju, Sanski Most, the mountains Vranica, Igman and Bjelasnica, and wider area of Sarajevo and Gorazde
- Ophiolite zone that encompasses Mountain Ozren and Mountain Konjuh (typical non-karst terrains where basic and ultra-basic rocks prevail) – the Sava River Sub-Basin
- Sava and Vardar zone (Tuzla Canton and Posavina Canton) – the Sava River Sub-Basin.

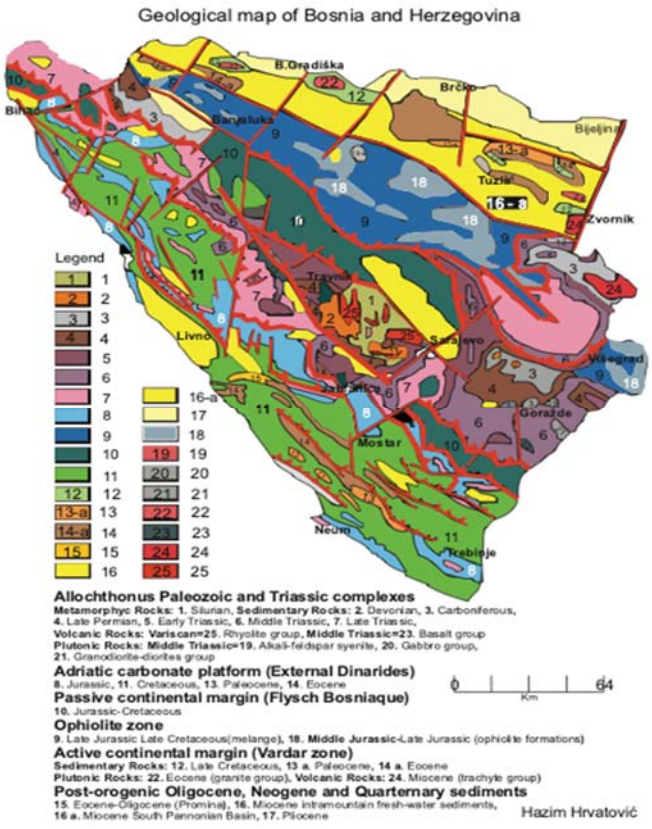


Figure 3: Geological map of BiH

[2] Water Management Strategy of the Federation of Bosnia and Herzegovina, March 2012

Within these paleogeographic and structural units, there are post-orogenic, oligocenic, neogenic and quarternary formations where considerable water bodies of intergranular porosity were formed. In the present structure of Dinarides, Oligocene-Miocene marine to fresh-water sediments originating after the final structuration of Dinarides, which took place during Eocene deformation phase, have very important role. In Bosnia and Herzegovina there are more than 150 small and large fresh-water basins with coal deposits out of which the best known in Bosnia and Herzegovina are Sarajevo-Zenica, Bugojno, Kamengrad, Livno, Tuzla and Mostar Basin. In selected fresh-water Neogene basins, the sediments are represented by marl-clay sediments, and rarely by conglomerates, sands, limestone and coal which are exploited. Most frequently found within these basins as top deposits are plio-quarternary sands and clayish sands with subordinate gravels.

3.2 Climate

The climate of FBiH is complex and is conditioned by its geographical position. The Adriatic Sea significantly affects the climate, especially in the coldest part of the year, when it alleviates extreme winter temperatures by releasing a large amount of thermal energy. The climate of FBiH is also influenced by mountains, lowlands, valleys, karst fields. The mountains of the Dinaric system have a particularly pronounced climatic influence, which is natural barrier to the penetration of cold air masses from the north and warm air masses from the south.

The southwestern part of FBiH has a Mediterranean climate. The pronounced relief, and especially the layout and direction of large mountain massifs, limit the effects of this climate to a narrow area and cause a very sudden transition to continental conditions. The continental and temperate continental climate is present in the area of northern Bosnia and in the valleys of the rivers Una, Sana and Bosna. In the north, the climate prevails all the way to the line that goes south from Bihac and Sanki Most to the border with Republic of Srpska. The hilly and mountainous parts of the FBiH are influenced by the Central European continental climate from the north and the Mediterranean climate from the south. The intertwining of these climatic influences, as well as diversity of the relief, give this area the characteristics of a temperate mountainous and mountainous climate.

The analysis of the map of the distribution of mean annual air temperature shows the influence of the most important climate modifiers (influence of the Adriatic Sea, Dinaric mountain system, openness to the continental part of Europe and the shape of the relief) on the temperature characteristics of FBiH. In Bihac, the average annual temperature is 10,6 °C, while in Tuzla it has value of 10 °C. On mountain peaks, the average annual temperatures are the lowest and drop to 1,2 °C (Bjelasnica, 2067 m). In the south of the entity, the average annual air temperatures are the highest, with values up to 14,1 °C in Capljina to 15,2 °C in Neum. The analysis of the annual course of air temperature in FBiH shows that the coldest month is January, and the warmest month is July.

The seasonal distribution of precipitation differs throughout the FBiH. In the northwest of FBiH, the main maximum of precipitation occurs in the colder part of the year (November), and the secondary maximum in May. The minimum precipitation was registered in January. For areas of low mountains, mountains, hills and lowlands, the share of precipitation in the warmer part of the year (March – September) is higher. Due to the influence of the Mediterranean climate, the southern regions are characterized by high precipitation in the colder half of the year, and dry summers with a minimum of precipitation in July.

Snowfall, which is a regular occurrence during the winter half of the year, has a significant share in the annual amount of precipitation in the northwest of the entity, as well as in the mountainous parts. On Bjelasnica, the maximum height of snow was measured in March 1986 and was 303 cm. In the south of the entity, precipitation in the form of snow occurs very rarely. Snow cover significantly impacts the water regime of rivers in the FBiH due to the large amounts of water accumulated in them, with the highest flows recorded in springtime, in April and May.

From the hydrological aspect, the area of FBiH is relatively rich in surface and underground hydrological network. The most significant river flows in the FBiH are the Una River and the Bosna River, which flow into the Sava River and belong to the Black Sea basin, and the Neretva River, which belongs to the Adriatic Sea basin. A significant part of the hydropower potential of the Neretva River is used.

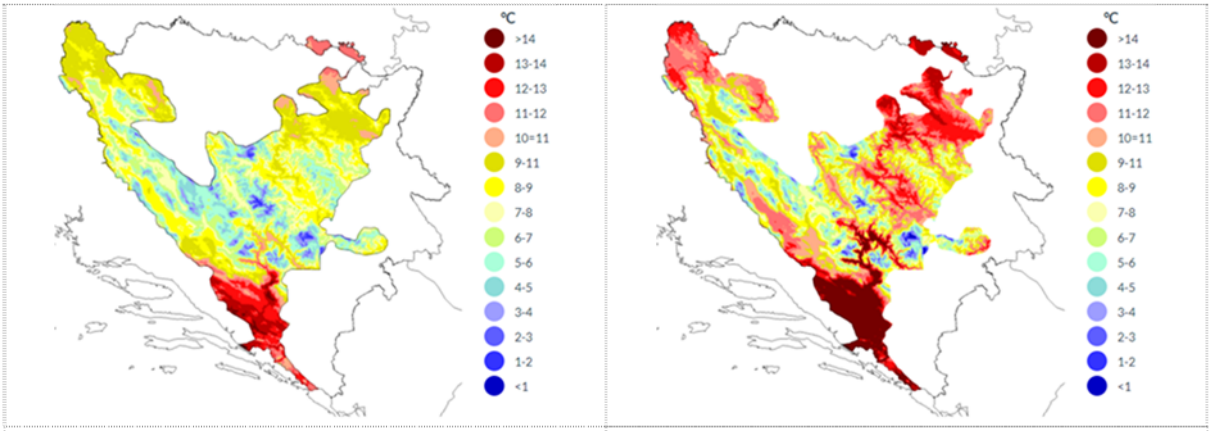
In annual distribution, the relative humidity is highest in late autumn (November) and in the first half of the winter period (December and January), and lowest during the summer, mostly in July. This schedule may be partially altered in the spring months due to sudden warming, the end of winter, or due to higher precipitation. The southern and southwestern parts of the entity have the lowest value of relative humidity in the territory of FBiH. The remaining part of the territory of FBiH has a continental flow of relative humidity (more than 70%) with certain local specifics. Fogs are characteristics of river valleys and valleys and can occur throughout the year, but are most frequent in spring and autumn.

Characteristic winds for the south of the entity are bora and jugo. The bora is very often of strong intensity. For mountains areas, winds from the southwest are characteristic, which have the attributes of a foehn wind. In the continental part of the entity, weak to moderate winds of variable direction prevail. Strong winds in this area are rare.

3.3 Climate Change

FBiH is affected by climate change and is taking significant steps to mitigate this problem on the domestic and international level. As solving of this problem is of strategic importance for BiH, but also for FBiH as its integral part, the *Strategy for Adopting to Climate Change of Low-Emission Development for BiH* was adopted in June 2013. According to the data from the Strategy, the highest increase in the average temperature of +1,2 °C in the summer months for the period 1981-2010 was recorded in Mostar, followed by Sarajevo with an increase of +0,8 °C. It is expected that temperatures will be even higher in future, with a tendency of rapid growth, as confirmed by the analyzes of hydrometeorological institutes in BiH.

According to the analysis of the Federal Hydrometeorological Institute, the temperature in Sarajevo, but also in FBiH, in all seasons during two periods considered (2011-2040 and 2041-2070) will increase. It is predicted that average annual temperature in Sarajevo will increase by +1,8 °C in the period 2011-2040 and by +4 °C in the period 2041-2070, compared to the reference period 1961-1990 when the recorded increase was +9,6 °C. According to the seasons, the largest increase in mean annual temperature is expected in summer for both periods considered. The smallest increase in the average annual temperature is expected in spring in the near future, and in spring and autumn in the distant future. Average annual temperature for the reference period and for 2018 in FBiH are shown in the following figure.



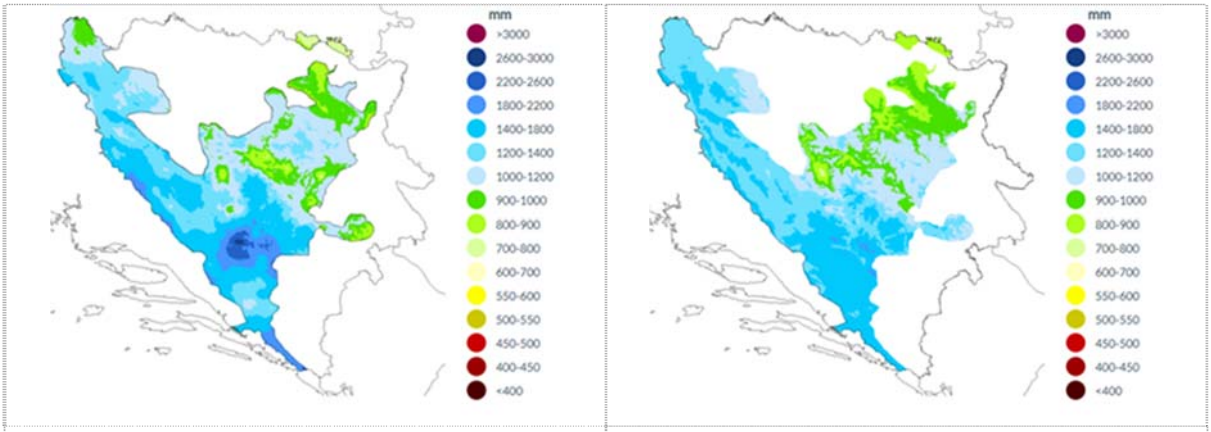
a) 1961-1990 b) 2018

Figure 4: Average annual temperature in the territory of FBiH

(Source: Federal Hydrometeorological Institute of BiH)

In the period since 1981, climate variability has increased during all seasons. The trend of rapid changes from extremely hot or cold periods to periods of intense rainfall has been observed. Droughts have also been more intense and frequent in the last twenty years. The risk of extreme temperatures (minimum and maximum), as well as drought, is assessed as **average**.

The Strategy also analyzes the annual precipitation throughout BiH. In the period 1981-2010, a large part of the territory of BiH showed a trend of slight increase in annual precipitation compared to the period 1961-1990. The greatest increase in annual precipitation in FBiH, was recorded in the central mountain areas (Bjelasnica), while the largest deficit was recorded in the south (Mostar). The greatest decrease in the amount of precipitation was recorded during the spring and summer in Herzegovina. In the autumn period, the greatest increase in the amount of precipitation was recorded, especially in the northern and central areas. According to the analysis of the Federal Hydrometeorological Institute of BiH, precipitation is expected to decrease in both winter and summer periods. The greatest tendency of decreasing precipitation is in the summer period, and it is predicted that it will decrease by 20% in the near future and 40% in the distant future. In general, spring precipitation shows a small decline in both periods. The amount of precipitation in autumn and winter will decrease by 5% in the near future, and by 20% in the distant future. The average annual precipitation amounts, on the territory of FBiH, are shown in the following figure.



a) 1961-1990 b) 2018

Figure 5: Average annual precipitation on the territory of FBiH

(Source: Federal Hydrometeorological Institute of BiH)

In the future, the risk of intense precipitation (floods) is assessed to be **very high**, while the risks of higher snow levels and storms is assessed as **high**.

FBiH is rich in water resources. The climate change has a significant impact on water sector. Forecasted changes in air temperatures and precipitation will negatively affect the water resources management system. Proper management of water resources could support FBiH's economic development and "green economy".

Increasing air temperature and decreasing rainfall in the spring and summer months will cause droughts and water shortages, while increased rainfall in the autumn and winter can cause flooding. The increase in dry, waterless periods in the summer days will occur in parallel with the increase in the evaporation rate, which will have a great impact on water quality. It is expected that such more extreme climatic conditions will become more frequent, as was evident from the large scale flooding in Southeastern Europe in 2014 that also flooded a large portion of Bosnia and Herzegovina.

Since climate change leads to an increase in water temperature, increase in the concentration of CO_2 in water, decrease in the concentration of O_2 in the water, and the acidification of watercourses, this in turn causes stress in fish, which adversely affects biodiversity. In general, the sensitivity of ecosystems to the effects of climate change has increased due to their distributed state, fragmentation and various anthropogenic impacts. It is

expected that climate change will significantly affect biodiversity in such a way that 15-37% of terrestrial species will become extinct due to climate change in the next fifty years, and the same trend will be reflected in freshwater species[3].

It is therefore important to increase the resilience of the FBiH to climate variability and long-term climate change,. This can be achieved, inter alia, through the efficient use of resources, increase in energy efficiency, utilization of renewable energy resources and improvement of energy and transport infrastructure and services.

3.4 Water Quality

3.4.1 General information

The surface and groundwater resources in BiH belong to two major river basins: the Black Sea Basin (i.e. Sava River Basin in BiH) and the Adriatic Sea Basins. The Sava River Basin covers 17,315 km^2 (67%) of the territory of the FBIH, while the Adriatic Sea Basin covers 8,621 km^2 (33%)[4]. There are 8 river sub-basins in BiH: Una (with Korana and Glina), Vrbas, Bosna , Drina, Cetina, Neretva, Trebišnjica, and Sava (*Figure 6*).

Apart from the inland waters, BiH has a territorial jurisdiction over a part of the Adriatic Sea along the coast of the Municipality of Neum and a part of the Mali Ston Channel.

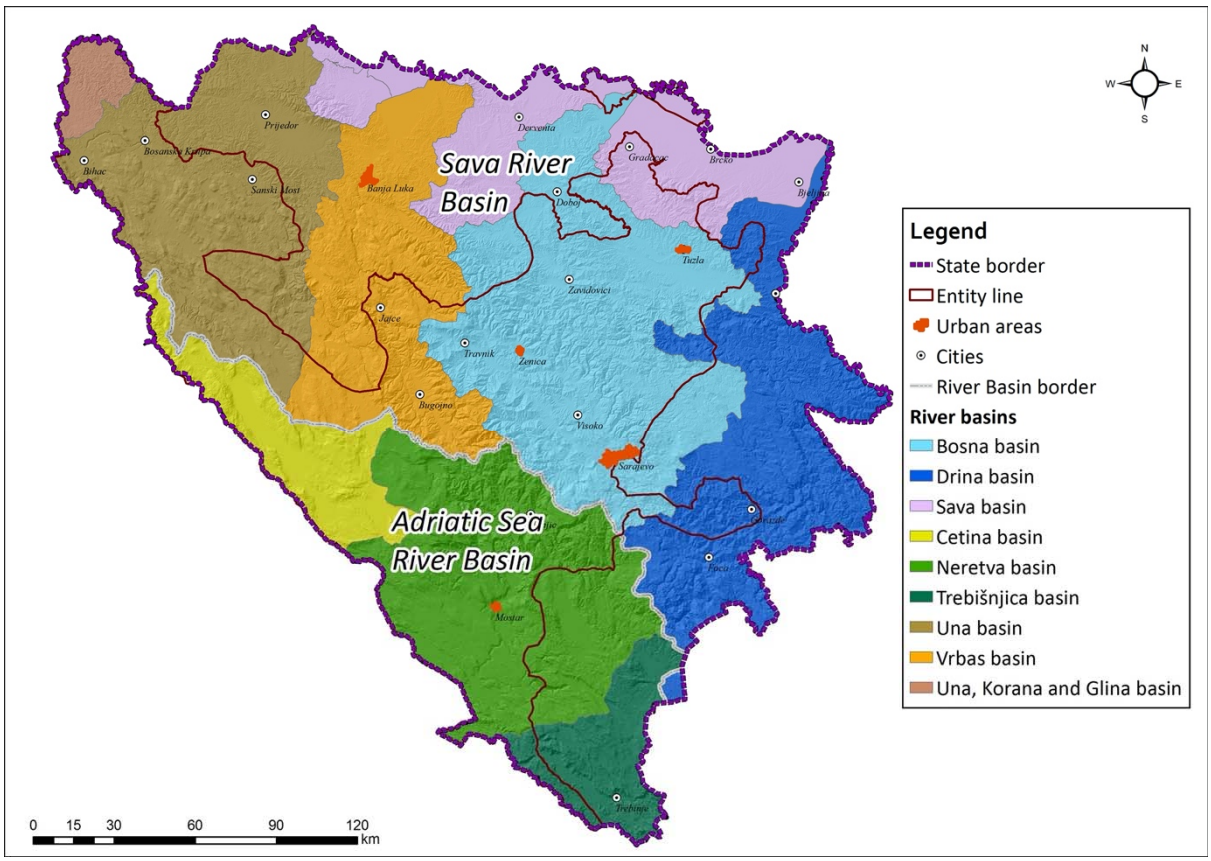


Figure 6: Major river basins and sub-basins in BiH

An average of 58.32 km^3 or 1,141 mm of precipitation was recorded in the period 2013 - 2017 on the BiH territory (51,129 km^2). The average evapotranspiration in the same period was equal to 25.74 km^3. Around 60% of the total precipitation ends up in rivers and outflow to neighboring countries (24.53 million m^3 or 480 mm) and to

[3] Third National Communication and Second Biennial Update Report On Greenhouse Gas Emissions of Bosnia and Herzegovina, available at: https://www.undp.org/content/dam/bosnia_and_herzegovina/docs/News/E&E%20Sector/TNC/TNC%20Report%20ENG.pdf

[4] Sava River Basin Management Plan in the Federation of BiH (2016 - 2021),Sava River Basin District Agency, Sarajevo, November, 2016

the Adriatic Sea (10.97 million m^3 or 214 mm). The inflow of water from neighboring countries to BiH is estimated at about 2 km^3 (39 mm).[5]

In the period 2013 - 2017 the total amount of renewable resources in BiH was estimated to be 26 - 51 billion m^3 per year[6]. Various climatic conditions, complexity of the hydrological network and geological substrates resulted in different distribution of water resources. So, for example, the Posavina region of the Sava sub-basin, that has the highest agricultural potential and heavy populated and industrialized Bosna River sub-basin are the two regions poorest in water resource.[7]

3.4.2 Use of freshwater resources

Around 60% of the population in FBIH is covered by organized water supply system (public water supply, local water supply networks)[8]. In the period 2013 – 2019, between 311 to 331 million m^3 of water was abstracted in BiH[9], of which, an average of 70% is used in the FBiH [10]. In the period 2013 - 2017, an average of 46% of water was abstracted from groundwater, 36% from springs and 14% from watercourses, while the remaining 4% was abstracted from reservoirs, lakes and other water supply systems (*Figure 7*). Water abstraction was reduced by an average of 5% from 2012 to 2019.

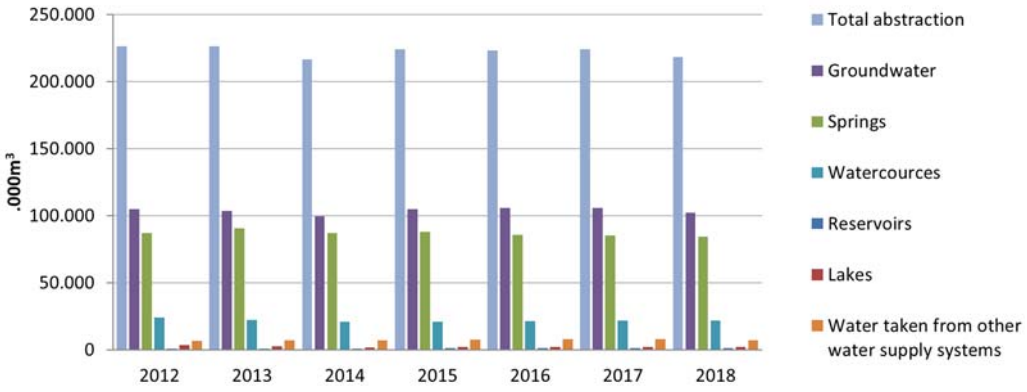


Figure 7: Water abstraction FBiH in the period 2012 – 2018

(Source: FBiH Office of Statistics, Statistical Yearbook of FBiH, 2019)

Considering the types and the structure of water use, it is important to note that 126.539 million m^3 or 58% of the total water abstraction in FBiH is lost in the water supply system (*Figure 8*)[11]. In the period 2013 to 2017, the percentage of water losses from the total water abstraction was very stable (+/- 2%) indicating lack of commitment of water companies and municipalities in BiH to address this problem.

[5]Data presented in billions of m^3 of water taken from the Report of the Agency for Statistics of BiH, Environment, Renewable Water Resources, Sarajevo, 2 June 2018, Year II. The calculation in mm is based on the equation dm^3/BIH surface area (m^2), if 1 mm precipitation = 1l/m^2.

[6]Ibid.

[7]Sava River Basin Management Plan in the Federation of BiH (2016 - 2021),Sava River Basin District Agency, Sarajevo, November, 2016

[8] Save River Basin District Agency in FBiH, Adriatic See District Agency , Water Management Strategy in Federation of BiH 2010 – 2022.

[9] Agency for statistics BiH, Public water supply 2015 -2019, five separate reports issued on October 2016 – 2020.

[10] The Brčko District institutions deliver reports on water supply and waste water management to the Agency for Statistics of BiH. However, these data for the Brčko District are not separately reported and the calculation according to the BD = BiH - RS-FBiH principle does not produce data that is reliable, stable, and referential.

[11] FBiH Office of Statistics, Statistical Yearbook of FBiH, 2019

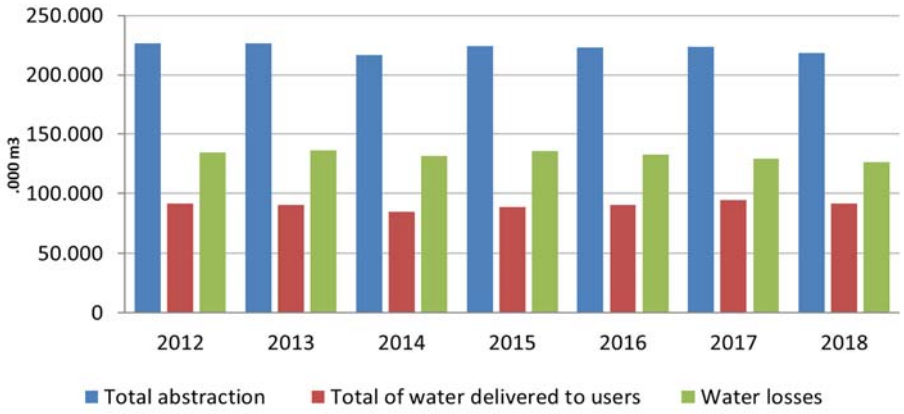


Figure 8: Total quantity of water delivered to water supply system and losses in the system in FBiH in the period 2012 – 2017

In 2019, the quantity of water used by households was on average about 66 million m^3 or 72% (*Figure 9*)[12]. Only 9% of the total amount of water delivered is consumed by industrial and construction consumers, while 10% of the total amount of water delivered is transferred to other water supply systems

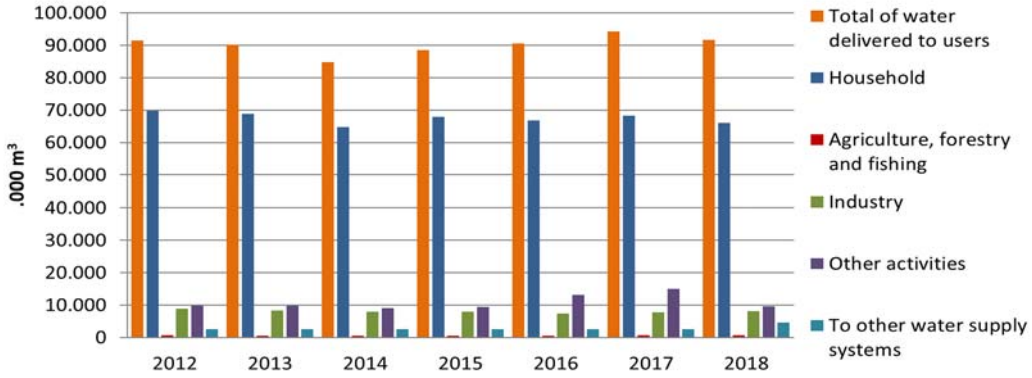


Figure 9: Water users in FBiH in the period 2012 – 2018

The length of the water mains in FBIH was in average 2,075 km in the period 2018, and 9,417 km of the distribution network (*Figure 10*)[13]. Compared to 2012, the length of the water mains increased in the observed period by 21%, and the length of the distribution network increased by 0,5%. During the period 2013 – 2018, number of connecting pipes increased by 10% , revealing the expansion of the population and industry coverage with water supply network.

[12] FBiH Office of Statistics, Statistical Yearbook of FBiH, 2019
[13] FBiH Office of Statistics, Statistical Yearbook of FBiH, 2012-2018

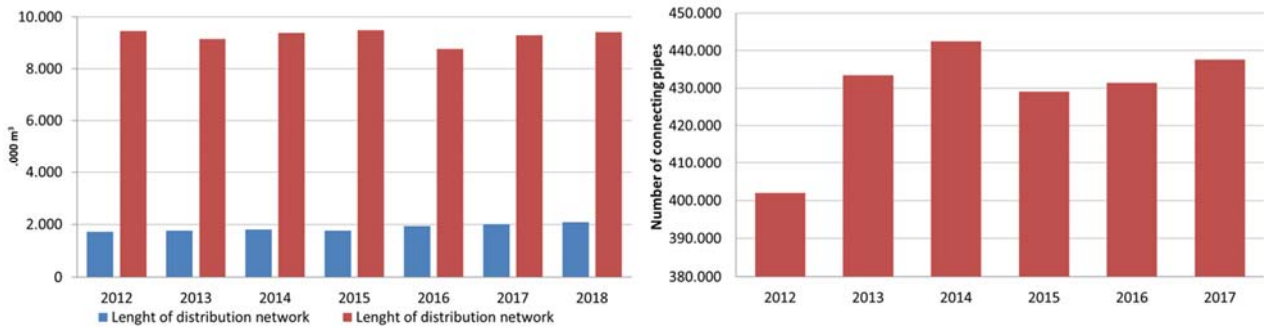


Figure 10: Length of the water mains and connection pipes in FBiH in the period 2012 – 2018

Water Exploitation Index (WEI)[14] for BiH in the period 2012-2015 amounted to an average of around 1.23%. In the period 2012-2014, the value of the indicators decreased between 1.49% and 0.81%, while 2015 marks growth at 1.6% (*Figure 11*)[15]. The growth and decline trends of WEI indicator are related to the growth and decline trends of available renewable resources. Values of WEI above 20% indicate that the water body is under pressure/stress, while the values above 40% indicate serious vulnerability and clearly unsustainable use of water resources [16]. Considering the EEA guidelines, it can be concluded that in the period 2013 – 2015, the BiH water resources were not under pressure in terms of use of renewable resources.

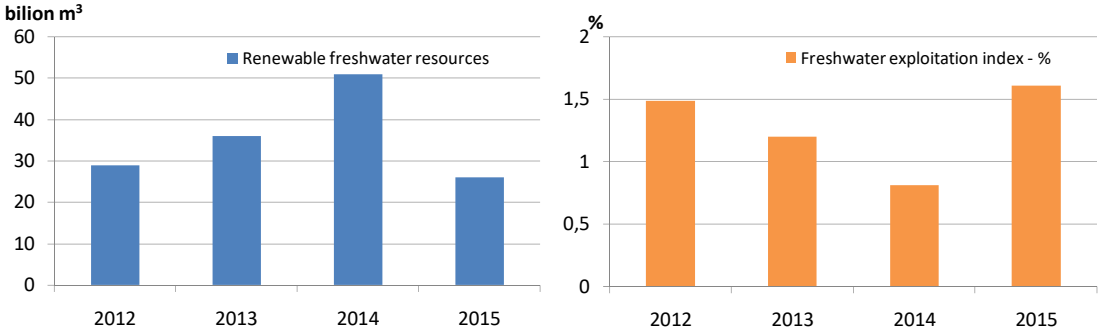


Figure 11: Renewable freshwater resources and water exploitation index in the period 2012 -2017

3.4.3 Urban waste waters

In the period 2013 - 2018, 61 to 95 million m^3 of wastewater was generated in FBIH (*Figure 12*)[17]. About 75% of wastewater comes from households. If comparing year 2013 to year 2018, the release of wastewater has increased by 18%. The wastewater discharge has particularly increased in the industry and construction activities (25%) and households (22%). The wastewater is mostly discharged into surface watercourses (96%), while the remaining wastewater is released into groundwater, reservoirs and the sea.

[14] Water exploitation index represents a percentage of total water abstraction available from renewable freshwater resources for BiH

[15] Agency for Statistics of BiH, Sustainable Development Indicators of BiH, TB-16, ISSN 1840 - 104X, Sarajevo 2017

[16] EEA indicator and database Use of freshwater resources, CSI 018, WAT 001 , https://www.eea.europa.eu/data-and-maps/indicators/use-of-freshwater-resources-2/assessment-3 Scientific research used pertaining to the establishment of recommended values published in scientific paper: Raskin, P., Gleick, P.H., Kirshen, P., Pontius, R. G. Jr and Strzepek, K. 1997 Comprehensive assessment of the freshwater resources of the world. Stockholm Environmental Institute, Sweden. Document prepared for UN Commission for Sustainable Development 5th Session 1997 - Water stress categories are described on page 27-29.

[17] FBiH Office of Statistics, Statistical Yearbook of FBiH, 2012-2018

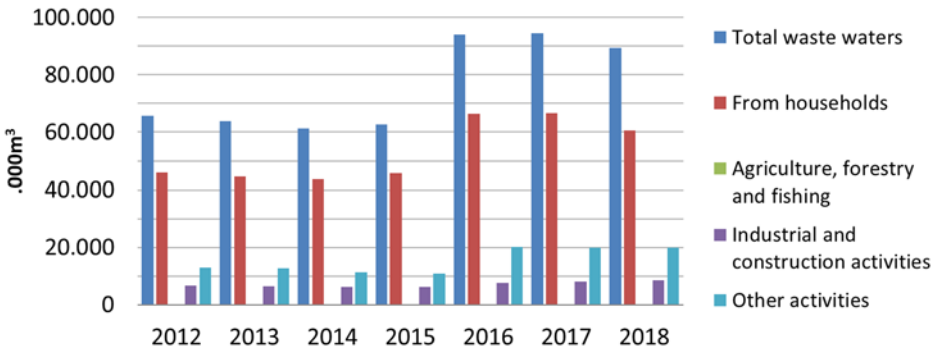


Figure 12: Waste water release in FBiH in the period 2012 – 2018

Given that the increase in the quantity of waste water was not accompanied by an increase in the quantity of water abstraction, this trend can be contributed to the increase in sewage network coverage. This progress was particularly intense in the period 2015 – 2017.

The length of the sewage network in 2018 was 2791 km of which 45% is made of combined sewers. The length of the sewage network increased by 11 % in the period 2013 -2018.

Significant progress was also made in terms of the quantity of wastewater treated. While only 4% of the total amount of wastewater had been treated in 2012, in 2018 this percentage increased to 57% of the total quantity of wastewater collected and discharged into water recipients. It is assumed that this percentage will continue to increase as number of new wastewater treatment plants are either in the tendering phase or under construction (*Table 2*). Here is to be noted that only 33% of the population is connected to public sewage network in FBiH[18], therefore large quantities of wastewater are still not captured by the existing collection systems.

Table 2: The status of construction of waste water treatment plants in FBiH

Inhabited area	*Capacity (ES)*	*Treatment level*	*Status*
FBiH - Sava River			
Sarajevo	600,000	II	Operational. WWTP Sarajevo is designed for II degree, with the possibility of achieving the III degree of processing (in the next phase). The trial operation period of the plant started in May 2016. The plant officially started operating on 22 May 2017.
Živinice	25,000	III	Operational. The plant officially started operating in March 2015.
Srebrenik	12,000	II	Operational. Operational since 2002.
Bihać	55,000	III	Operational. The trial operation period of the plant started in 2017. WWTP Bihać should officially start its operations in 2018.
Trnovo	5,000	II	Operational. Operational since 2009.
Žepče	10,000	II	Operational. The plant is operational since 2007, but the existing plant was reconstructed in 2013.
Odžak	10,000	II	Operational. PPOV in Odžak built in 2011, in July 2012 a drain collector from WWTP to the Bosna River was constructed.
Gradačac	30,000	II	Operational. WWTP of the Gradačac City was built in 1982. It was designed and built for the capacity of 30,000 ES. In 1998 parts of the plant damaged by war were reconstructed. The last reconstruction of the plant was started in

[18] Save River Basin District Agency in FBiH, Adriatic See District Agency , Water Management Strategy in Federation of BiH 2010 – 2022.

Inhabited area	*Capacity (ES)*	*Treatment level*	*Status*
			June 2016 and the trial operational period of WWTP Gradačac started on 27 September 2017.
Cazin	30,000	II	Ongoing. Project documentation ongoing.
Bosanski Petrovac	5000	II	Ongoing. Contracting in progress.
Orašje	12,000	II	Ongoing. Tender documentation for WWTP construction is ready. There is a lack of funds for construction.
Lukavac	16,000	II	Ongoing. Tender documentation for WWTP construction is ready. There is a lack of funds for construction.
Tešanj	30,000	II	Ongoing. Preliminary design was prepared on 28 April 2017 and a Contract with the Contractor was signed concerning the development of project documentation.
Doboj South	2,000	II	Ongoing. Preparation of tender documents still ongoing.
Usora	1,000	II	Ongoing. Tender documents have not been prepared. According to the available information, the waste water of Usora will be directed to WWTP Tešanj.
Velika Kladuša	15,000	II	Ongoing. Tender documentation for WWTP construction is ready. There is a lack of funds for construction.
Jajce	6,000	II	Ongoing. Tender documents were drafted in 2016. Lack of funds for the implementation of tender procedure.
FBiH - Adriatic Sea			
Mostar	100,000	III	Trial operation of WWTP is ongoing.
Čitluk + Međugorje	7,000/+7,000	III	Operational. Operational since 2009.
Jablanica	3,275	II	Operational since 2011, 3 compact devices in the very city, 4 on the periphery of the Jablanica lake accumulation and 1 on the Glogošnica River. Total capacity of 3,275 ES.
Konjic	6,000	III	Operational since 2016.
Neum	5,000	I	Operational. Waste water is drained to WWTP and released in Croatia
Grude	2,500	II	Operational since 1997.
Ljubuški	6,000	II	Operational. Built in capacity of 5000 ES and renewed in 2014.
Tomislavgrad	6,000	II	Selection of the most economically advantageous contractor for the construction of WWTP. Tender publicized in March 2017.
Prozor - Rama	3,000	II	Ongoing. The procedure for the selection of the most economically advantageous contractor completed. Contracting in progress.
Široki Brijeg	5,000	II	The construction is planned, but the procedure for the preparation of tender documents or for the contracting of the design documentation development and the contractor has not been initiated.
Kupres	5,000	II	
Livno	15,000	II	
Čapljina	10,000	II	
Stolac	5,000	II	
Bosansko Grahovo	3,000	II	The rehabilitation of the existing plant that is completely devastated.
Posušje	10000	II	The construction is planned, but the procedure for the preparation of tender documents or the contracting of the design documentation development and the contractor has not been initiated.
Glamoč	4500	II	

The percentage of population connected to waste waters treatment systems with at least secondary treatment increased from 2% in 2006 to 21.7% in 2016 as a results of putting wastewater treatment plants in Sarajevo and Konjic in operation. Newer data are not available but the percentage increase can assumed given that the

wastewater treatment plant in Bihać have been put in operation, and that the capacities of the wastewater treatment plant in Gradačac have been increased. It is important to note that one of the main issues operators of WWTPs still face is the most suitable method for management of sludge produced.

3.4.4 Surface water quality

The regular monitoring of surface waters is carried out by the Water Agencies of the Sava and the Adriatic Sea River Basins in line with the entity legislation[19] that is aligned with the EU Water Framework Directive.

There are 533 water bodies in FBiH Sava river basin, and 216 in Adriatic See river basin identified following the WFD methodology[20]. The results of the water quality monitoring are presented on the following diagrams, separate for water bodies belonging to the Adriatic Sea Basin and the Sava River Basin[21].

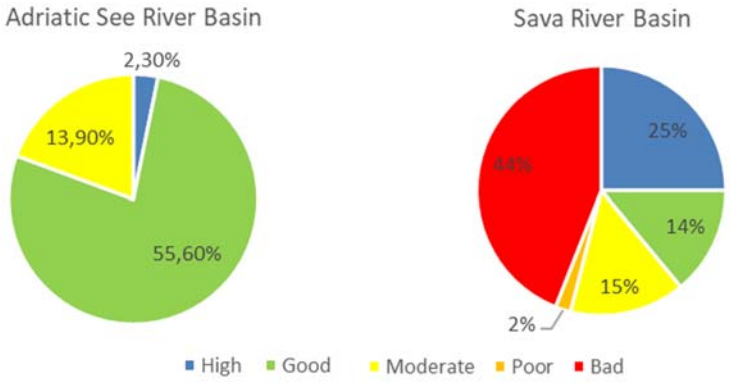


Figure 13: Quality status of surface water in FBiH

The results of the conducted watercourses monitoring are used for the development of Water Management Plans managed by relevant water management institutions. The Water Management Plans define necessary measures and activities in order to achieve a good water status. Based on the assessment done, all water bodies in FBiH will reach good status by 2039.

3.5 Waste Management

It is estimated that in FBiH 2.219.220 inhabitants produce around 640.000 tons of waste per year with 60% being generated in urban and 40% in rural areas[22]. The number of inhabitants served is approximately 67.5%. The organic waste is the dominant fraction and varies from 25% (cantonal average) up to 50% (municipal average). The dry recyclables (plastic, glass, paper, metals, aluminum cans, PET) accounts for 24-38% of the total waste. The percentage is lower in rural municipalities and higher in the urban cantons, especially Sarajevo Canton.

Separation at source is in its infancy and it amounts to less that 1% of waste generated.

[19] Law on Waters (Official Gazette of FBiH, 70/06) and Decision on characterization of surface and groundwater, reference conditions and parameters for assessment of water status and water monitoring (Official Gazette of FBiH, 1/14)

[20] Water Management Plan for Sava River Basin in FBiH (2016 – 2021), Water Management Plan for Adriatic Sea Basin in FBiH (2016 – 2021) both adopted in 2018

21 Ibid.

[22] Municipal Solid Waste Management Sector Review: Strategic Directions and Investment Planning up to 2025, World Bank (2018)

In the FBiH sorting lines for pre-separated dry recyclables are located at Sarajevo cantonal regional landfill and at Konjic municipal landfill. Two mixed waste separation lines are installed in Mostar regional landfill and Tuzla municipal landfill.

Waste collection in FBiH is carried out by municipalities and one Cantonal public enterprise in Canton Sarajevo. Currently there are 4 regional landfills constructed and operational in FBiH. These RLs are located in Sarajevo, Livno, Mostar and Zenica. These landfills receive waste from 24 municipalities (3 in Livno Region; 4 in Mostar; 9 in Sarajevo; and 8 in Zenica that 2 fully and 6 partially). Furthermore, there are 9 municipalities that are currently transporting their waste to regional landfills in RS (Zivinice to Doboj and Zvornik; Sapna and Kalesija to Zvornik; Srebrenik, Lukavac, Doboj Jug, Doboj Istok, Usora to Doboj; Teocak to Bijeljina). Therefore, more than 1/3 of the municipalities in FBiH (generating more than 50% of total municipal solid waste) are currently serviced by one of the regional landfills (RL) in FBiH and RS[23], and the rest are still disposing their waste in wild dumps and non-sanitary municipal landfills. The regional landfills receive both municipal waste and non-hazardous industrial waste (approximately 7-10% of MSW).

The following table provides data on the amount of generated waste by the preliminary selected municipalities where the Project facilities will be located and status information on the landfill at the site to which they belong.

Table 3: Amount of generated waste and Landfill Status of the Project cities/municipalities[24]

City/Municipality	*Citluk*	*Siroki Brijeg*	*Gracanica*	*Tesanj*
Estimated amount of total waste generated (tons/year)	4.980	8.213	13.707	11.174
Landfill Status	Operational RL Uborak Mostar is servicing Mostar City, Siroki Brijeg, Grude, Ljubuski; Citluk uses municipal landfill. Mostar RL will soon be closed and currently new location for RL is sought before it can serve more municipalities from the region.		Development of the originally planned RL in Lukavac has been unsuccessful. Currently, municipalities of Lukavac and Srebrenik transport the collected waste to Doboj non-sanitary RL. Alternative site for these two cities would be future regional landfill in Zivinice.	A well-managed, but non-sanitary RL in Doboj (located in RS) is currently serving 6 municipalities from FBiH. Some of these municipalities will be transporting their waste to Zivinice RL, once constructed, and some will continue to be served by Doboj RL. This site has prepared all the technical design and documentations to be upgraded to a sanitary RL.

3.6 Biodiversity and Protected Areas

3.6.1 Habitats

The Federation of BiH is very rich in landscape diversity consisting of all forms of geological and biological diversity: Mediterranean landscapes, Sub-Mediterranean landscapes, Mediterranean-mountain landscapes, and Oro-Mediterranean landscapes. From the lowest levels of Bosanska Posavina (altitude 100 m) to the highest mountain peaks (Cvrsnica, Vranica, Bjelasnica) the following landscapes evolved: Peripanonian landscapes,

[23] Some of the federal municipalities dispose their waste to regional landfills in RS
[24] Municipal Solid Waste Management Sector Review: Strategic Directions and Investment Planning up to 2025, World Bank (2018)

Panonian landscapes, Highland landscapes, Hilly landscapes, and Mountain landscapes. Each landscape can be divided into several ecosystems (forests, meadows, rocky ground, osier-bed and ecosystems of arable and inhabited land) [25].

A unique quality of the FBiH area is recognized in specific landscapes:

- **High mountain landscapes** found at higher altitudes in central and northern FBIH are dominantly covered by mountain meadows, alluvial plains, cracks, basophilous peat bogs, pre-mountain ecosystems of pine trees, beech, white bark-pine, spruce and fir tree. Very diverse and biologically relevant ecosystems are located at steep slopes, sinkholes, depressions, on cliffs with carbonate and siliceous geological base and shallow humus-based accumulation soil.
- **Relict and refugial ecosystems** which accommodate many types of relict plants and animals, are crucial for biodiversity of BiH, and thereby for global diversity. They include:
  - Landscapes of relict pine forests in dolomites and ophiolitic zone with ecosystems of Illyrian pine and white bark pine;
  - Landscapes of relict and refugial ecosystems in canyons and cliffs of Una, Sana, Neretva, Bosna and Drina rivers, (which contain the largest diversity of ecosystems and habitats).
- **Marshy landscapes** such as Hutovo Blato, Busko Blato, mountain lakes of Kupres, Bjelasnica, Prenj, Cvrsnica, Sator, and island-shaped marshy areas in Vranica and Zvijezda, which are nowadays the most endangered ecosystems in FBiH. Marshy areas are habitats of many rare plants and different species of birds, reptiles, amphibians and fishes.
- **Complex ecosystem of Karst valleys** (Grahovsko, Livanjsko, Glamocko, Kupresko, Suicko, Grudsko, Posusko, Dugo polje, Mostarsko Blato, Ljubusko, Stolacko and western part of Popovo polje with hydro geological and morphological phenomenon – the Cave of Vjetrenica). Ecologically and biologically the most interesting Karst phenomenon are Karst valleys [26].

Over 50 habitat types are identified in the FBiH, many of which are priority habitats according to Annex I of Habitats Directive, such as: Mediterranean temporary ponds, turloughs, bushes with *Pinus mugo* and *Rhododendron hirsutum*, pseudo-steppe with grasses and annuals of the Thero-Brachypodietea, Petrifying springs with tufa formation (Cratoneurion) and Medio-European calcareous scree of hill and montane levels[27].

3.6.2 Flora

The Red List of Flora in FBiH contains the list of 658 plant species of which the highest number of endemic species in FBiH belongs to flora of vascular plants. Current data show that 450 endemic taxa can be found in BiH. Many of those are located in endemic centers in FBiH. The studies confirmed that the high mountains of northern Herzegovina (Prenj, Cvrsnica, Cabulja) are the richest in endemic species (125 taxa) with the mountain Prenj being the single richest source of endemic flora (99)[28]. Species of special interest are stenoendems that can be found in the aforementioned Prenj-Cvrsnica-Cabulja complex or Neretva Canyon such as: *Acinos orontius*, *Alyssum moellendorfianum*, *Asperula hercegovina*, *Barbarea bosniaca*, *Campanula hercegovina*, *Dianthus freynii*, *Edraianthus niveus*, *Oxytropis prenja* etc.

In the Livanjsko polje area, the previous research has reported presence of over 700 species of vascular plants, including a number of endemic species found exclusively in karst fields such as *Molinia coerulea*, *Peucedanum*

[25] Federal Ministry of Environment and Tourism (2010). State Of The Environment In The Federation Of Bosnia And Herzegovina Report.
[26] Federal Ministry of Environment and Tourism (2010). State of the Environment in the Federation of Bosnia and Herzegovina Report.
[27] Project: Support to Implementation of the Birds and Habitats Directives in Bosnia and Herzegovina
[28] Lubarda, B.,Stupar, V., Milanovic, Dj., & Stevanovic, V. (2014). Chorological characterization and distribution of the Balkan endemic vascular flora in Bosnia and Herzegovina. *Botanica Serbica*, *38*(1), 167-184.

pospichalii, *Gladiolus illyricus*, *Carex panicea*, *Scilla littardierei*, *Hieracium pavichii*, *Edraianthus dalmaticus,* etc., as well as a large number of medicinal, aromatic and honey plants.

Hutovo Blato is a Ramsar and IBA site, as well as a protected area in FBiH with high biodiversity value. Marsh, wet meadows, alluvial *Salix* sp., *Alnus* sp. And *Populus* sp. forests along with dry and warm shrubland offer habitats for many plant and animal species. The vegetation of Hutovo Blato consists of 39 plant communities. The *Fimbristylion dichotomae* communities are especially valuable because of the rare and endangered FBiH plants, e.g. *Ludwigia palustris*, *Veronica anagalloides* and *Baldel liaranunculoides*. Valuable marsh plant communities provide suitable biotopes for the breeding and resting of water birds[29].

Local environmental action plan (LEAP) of Siroki Brijeg municipality lists the following species as endemic or endangered: *Campanula hercegovina, Edraianthus tenuifolius, Helleborus hercegovinus, Lonicera barbasiana, Astragalus illiricus, Aspenula hercegovina, Petteria ramentacea, Frittilaria meleagris, Galanthus nivalis, Crocus neapolitanus, Gladiolus illiricus*, and all species of family Orchidaceae[30].

3.6.3 Fauna

Invertebrates

Fauna of aquatic insects is the most representative of freshwater ecosystems in FBiH with high level of diversity and endemism. The fauna of mayflies comprises of 58 species belonging to 20 genera, of which five are Dinaric, Balkan or Dinaric-alpine endemic species[31].

Karst caves are believed to be rich in endemic species but they have only been sporadically researched. One of the most famous and fauna-richest caves in the country is Vjetrenica in Popovo Polje. Over 100 species have been recorded there, including 35 species of troglobionts (cave-dwelling creatures) such as *Dinaria vjetrenicae, Stalagtia hercegovinensis* or *Lanzania vjetrenicae vjetrenicae*[32].

In the Project municipalities, the river Listica in the municipality of Siroki Brijeg has a high diversity of macrozoobentos and very high water quality[33]. The European crayfish (*Astacus astacus*) is no longer regularly seen near this river which indicates habitat degradation and pollution. This river is also flowing through the Mostarsko Blato karst field and this inflow is of big importance to the ecosystem of Mostarsko Blato. An endemic species of Trichoptera *Drusus ramae* is found in the woter of spring Borak. According to information presented in the Local Environmental Action Plan (LEAP) of Siroki Brijeg, the following invertebrate species should be protected: *Lucanus cervus, Formica rufa, Papilio machaon*[34].

Fish

Fish fauna of the FBIH is relatively well investigated. A lot of species of fish from the families of Salmonidae, Ciprinidae, Perciedae, Thymallidae, Cottidae and Centrarchidae live in the FBiH rivers. River Neretva and its tributaries are notable for endemic and autochthonous species, among which are marble trout (*Salmo marmoratus*), softmouth trout (*Salmothymus obtusirostris oxyrhychnus*), Neretvan nase (*Chondrostoma knerii*) and Adriatic dace (*Squalius svalizze*). Dalmatian barbelgudgeon (*Aulopyge huegelii*), which is classified as endangered according to the IUCN classification, can be found in karst creeks and lakes of southwestern FBiH.

[29] Jasprica, N., & Caric, M. (2002). Vegetation of the natural park of Hutovo Blato (Neretva river delta, Bosnia and Herzegovina). *Biologia Bratislava*, 57*(3)*, 505-516.

[30] http://www.sirokibrijeg.ba/index.php/dokumenti/finish/3-dokumenti/160-lokalni-ekoloski-akcijski-plan-leap

[31] Bosnia and Herzegovina Fourth Report to the United Nations Convention on Biological Diversity

[32] Lukic-Bilela, L., Ozimec, R., Tulic, U., & Pojskic, N. (2012). Katalogizacija spiljskih tipskih lokaliteta faune Bosne i Hercegovine. [Cave Type Localities Catalogization Of Fauna In Bosnia And Herzegovina]. International Conference „Structure And Dynamics Of Ecosystems Dinarides – Status, Possibilities And Prospects".

[33] https://repozitorij.pmf.unizg.hr/islandora/object/pmf%3A8317/datastream/PDF/view

[34] http://www.sirokibrijeg.ba/index.php/dokumenti/finish/3-dokumenti/160-lokalni-ekoloski-akcijski-plan-leap

According to the FBiH Red list of fauna, seven fish species are considered critically endangered: *Acipenser sturio*, *Salmo marmoratus*, *S. obtusirostris*, *Telestes methohiensis*, *T. turskyi*, *Squalius microlepis* and *Chrondrostoma phoxinu.*

Marine biology is relatively new research field developed in FBiH. According to some authors, out of 12 confirmed species of cartilaginous fish in Neum bay, three species can be considered as critically endangered and another three as endangered[35].

In the Project municipalities, the river Usora in the Tesanj Municipality is rich with the following species: *Barbus barbus, Abrmis brama, Leuciscus cephalus, Rutilus pigus virgo, Leucaspius delinetus, Gobio gobio, Alburnus alburnus, Chondrostoma nasus, Aspius aspius, Scardinius erythrphtalamus, Leuciscua leuciscus, Carassius aratus gibelio*[36]. The disturbance of the balance was caused by the excessive extraction of gravel from the riverbed, which caused the disappearance of three fish species.

The problem of anthropogenic pressure is common in many ecosystems in FBiH, which among the others, caused the disappearance of *Conger conger* in the river Listica in Siroki Brijeg. It has been also reported that the European crayfish and otters cannot be found in these river anymore.

Amphibians and Reptiles

A total of 23 species of amphibians are recorded in the FBiH, of that 14 species are on the FBiH Red list of fauna. Some of the most unique features of the FBiH amphibian diversity are *Salamandra atra prenjensis* – endangered subspecies of alpine salamander endemic to Mts Prenj and Cvrsnica in FBiH, and *Proteus anguinus* – endangered olm endemic to the Dinaric karst. *Triturus carnifex*, which is listed in Annex II of the Bern Convention, is found on only one location in the whole BiH, near Bihac in northwestern part of the FBiH[37].

A total of 33 reptile species can be found in BiH, and 30 of them can be found in FBiH as well. Reptiles are dominant in southern, warmer parts of FBiH. Somewhat recent discoveries of sea turtles *Caretta caretta* and *Dermochelys coriacea* in Neum bay have highlighted the need for research and better management of FBiH's coastal waters. Both of there species are listed as vulnerable (VU) by IUCN. The Red list of fauna of FBiH considers 28 species.

Birds

Diversity in landscapes and ecosystems supports high diversity in bird species as well. Total od 328 species of birds have been found on the FBiH Red list. Most of the species are nesting, while migratory species have seasonal presence, usually near water bodies. Most important sites for migrating birds in FBiH are Hutovo Blato and Livanjsko polje with Busko Lake, also being recongnised as IBA sites. In the area of Livanjsko polje, including the artificial accumulation Busko Lake in its southeastern part, 235 species of birds have been registered so far. The nesting population of the corn crake *Crex crex* in Livanjsko polje stands out as extremely numerous – this is the largest nesting population in whole BiH and one of the most numerous in the entire Balkan region. Many species can be seen during the nesting period, among which are the Montagu's harrier *Circus pygargus*, the short-toed snake eagle *Circaetus gallicus*, the white-tailed eagle *Haliaetus albicilla*, red-crested pochard *Netta rufina*, red-backed shrike *Lanius colurio*, northern lapwing *Vanellus vanellus* etc. It is interesting that Livanjsko polje is the southernmost nesting site in Europe for common snipe *Gallinago gallinago*. Livanjsko polje is an

[35] Gajić, A., Kahrić, A., & Lelo, S. (2017). Preliminarni prijedlog crvene liste elasmobranhija, klasa Elasmobranchii Bonaparte, 1838, u Bosni i Hercegovini. [Preliminary proposal of the Red list of the elasmobranchs, Classis Elasmobranchii Bonaparte, 1838, in Bosnia and Herzegovina.] *Prilozi fauni Bosne i Hercegovine*, 13, 21-34.

[36] https://opcina-tesanj.ba/wp-content/uploads/images/dokumenti/eko%20strategija.pdf

[37] https://www.bhhuatra.com/species/amphibians/triturus-carnifex

extremely important resting place for the Eurasian spoonbill *Platalea leucorodia* and other species that migrate along the Adriatic Flyway, and 70,000 wetland species were recorded during the winter[38].

Mammals

The FBiH Red List of Fauna evaluates a total of 79 species. The most numerous mammals in FBIH are rodents (shrews, hedgehogs, moles, rabbits, squirrels, mice, down and voles), martens, wild boars, deer and other game species.

Three large carnivores can be found in mountainous and hilly parts of FBiH – gray wolf, brown bear and Eurasian lynx. *Canis lupus kurjak* subspecies of the gray wolf was described by S. Bolkay as Bosnian wolf in 1925. However, this is not an accepted subspecies in modern classification of the Eurasian wolf. In FBiH, the number of individuals in the population of brown bears was not determined and nothing is known about the dynamics of movement, including the territories of individuals[39].

Municipality of Tesanj has a hunting ground that covers the whole municipality. Some of the species present within its limits are: fox, rabbit, roe deer, European polecat, wild boar etc. [40]

3.6.4 Protected Areas

The total of 12 Protected Areas (Pas) have been proclaimed to date covering 84,677.39 ha or 3.24% of the FBiH teritorry. Out of 12 PAs, one is a National Park (IUCN Category II), six are Nature Parks or Nature Monuments (IUCN Category III) and five are Protected Landscapes (IUCN Category V). Coastal and sea areas in FBiH have not been protected so far. All FBIH PAs are shown in *Figure 14* and *Table 4*.

[38] Nase ptice (2018). Zastitimo jadranski seobeni put [Let's protect the Adriatic Flyway]. Avaliable at: https://ptice.ba/wp-content/uploads/2018/04/ZJSP-LIVANJSKO-POLJE.pdf [in Bosnian].

[39] Trbojevic, I. (2016). Distribution of brown bear (Ursus arctos L., 1758) on mountains Manjača, Čemernica and Uzlomac, north of Bosnia and Herzegovina. Avaliable at: https://www.researchgate.net/publication/299493473_Distribution_of_brown_bear_Ursus_arctos_L_1758_on_mountains_Manjaca_Cemernica_and_Uzlomac_north_of_Bosnia_and_Herzegovina

[40] https://opcina-tesanj.ba/wp-content/uploads/images/dokumenti/eko%20strategija.pdf

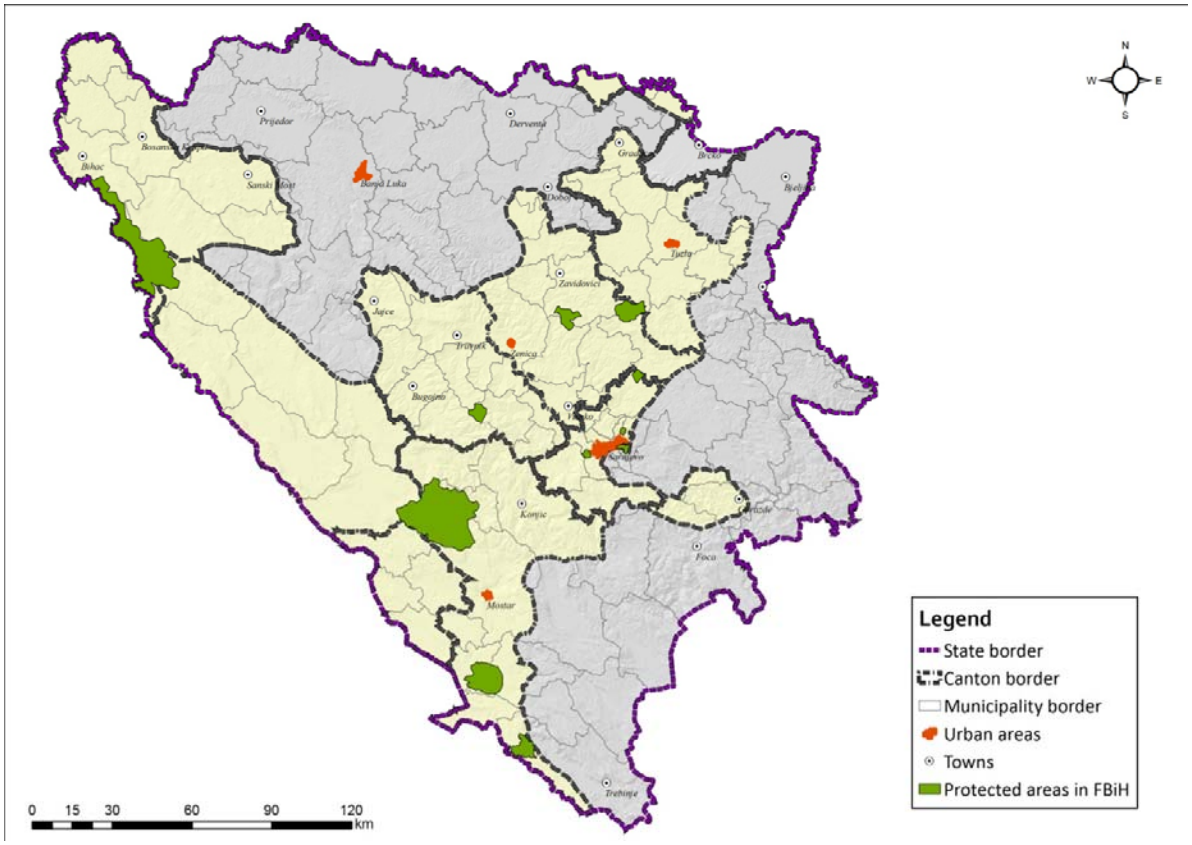


Figure 14: Protected Areas in FBiH

Table 4: List of Protected Areas in FBiH with IUCN Categorization and Area

No.	*Name of protected area*	*IUCN Category*	*Area in hectares*
1.	Una National Park	II	19,800.00
2.	Blidinje Nature Park	III	35,800.00
3.	Hutovo Blato Nature Park	III	7,411.00
4.	Skakavac Waterfall Nature Monument	III	1,430.70
5.	Prokoško Lake Nature Monument	III	2,225.00
6.	Vrelo Bosne Nature Monument	III	631.00
7.	Tajan Nature Monument	III	4,948.35
8.	Bijambare Protected Landscape	V	497.00
9.	Konjuh Protected Landscape	V	8,645.34
10.	Trebević Protected Landscape	V	400.20
11.	Bentbaša Protected Landscape	V	160.90
12.	Vjetrenica Cave Protected Landscape*	V	4,710.17*

*considered as protected however with no legal protection since the procedure of re-proclamation and re-categorization is ongoing

The Proposal of the Spatial Plan of the FBiH (2008-2028), which is still in the process of adoption, envisages the establishment of 14 new protected areas with a total spatial coverage of 18.5% of the FBiH territory. *Table 5* lists planned PAs in FBiH[41].

[41] Proposal of the Spatial Plan of the FBiH (2008-2028)

Table 5: Planned PAs in FBiH

No.	*Name of protected area*	*Area in hectares*
1.	Igman – Bjelasnica – Treskavica – Visocica – Rakitnica River Canyon	95,032.4
2.	Prenj – Cabulja – Cvrsnica - Vran	101,744.3
3.	Mt. Vranica	25,078.1
4.	Mt. Grmec	78,939.8
5.	Radusa – Stozer - Crni Vrh	42,415.5
6.	Mt. Sator	29,736.3
7.	Dinara	26,314.9
8.	Mt. Pljesevica	5,094.7
9.	Livanjsko Field	19,833.8
10.	Mt. Vlasic	12,382.9
11.	Popovo Field - Vjetrenica	3,572.5
12.	Canyons of Neretva, Doljanka, Ribnica and Drezanka	7,357.3
13.	Pliva Lakes	633.9
14.	Una River Basin	34,685.8

Currently ongoing UNDP project[42] is aiming at protecting additional five areas in FBiH:

1. Botanical and floral reserve Mediteranetum in Municipality of Neum (Herzegovina-Neretva Canton)
2. Cave system Vjetrenica (Herzegovina-Neretva Canton)
3. Livanjsko Field (Canton 10)
4. Bjelasnica– Visocica– Treskavica–Rakitnica River Canyon (Herzegovina-Neretva Canton and Sarajevo Canton)
5. Mountain Zvijezda (Municipality of Vares, Zenica-Doboj Canton).

There are a total of 11 Key Biodiversity Areas (KBA) in BiH and 7 are found in FBiH. These sites have been qualified for KBA as IBA sites in the CEPF Ecosystem Profile of the Mediterranean Hotspot[43]. Two IBA[44] sites Hutovo Blato and Boracko lake are recognized in BiH, as well as five sites identified as biodiversity hotspots: Livanjsko polje, Mostarsko Blato, Neretva river, Trebizat river tributary and North Travunia (shared with RS). The FBiH also has two Ramsar[45] sites: Hutovo Blato and Livanjsko polje. However, IBA and Ramsar sites are not legally recognized by legislation on nature protection in FBiH.

3.6.5 Potential Natura 2000 sites

The Government of FBiH adopted the *Decree on the Natura 2000 Program – Protected Areas in Europe*[46] that reflect the requirements of the EU Birds and Habitat Directives. This decree has been a basis for proclaiming the ecological network of protected natural habitat types and species in the FBiH, which would than become a part of the international network of protected natural habitats and species. The project *Support to Implementation of the Birds and Habitats Directives in Bosnia and Herzegovina* project has proposed potential 57 Natura 2000 sites for the whole FBiH. Unfortunately none of the sites have been officially designated yet.

[42] Global Environment Facility is funding the ongoing project Achieving Biodiversity Conservation through Creation and Effective Management of Protected Areas and Capacity Building for Protection of Nature in BiH (2017-)- The project is implememnted by UNEP BiH. Available at: https://www.thegef.org/project/achieving-biodiversity-conservation-through-creation-effective-management-and-spatial

[43] Avaliable at: https://www.cepf.net/sites/default/files/mediterranean-basin-2017-ecosystem-profile-summary-english.pdf

[44] IBA is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations.

[45] Wetlands protected by national governments to fulfil their obligations under the Convention on Wetlands of International Importance (the Ramsar Convention).

[46] Official Gazette of FBiH, No. 41/11

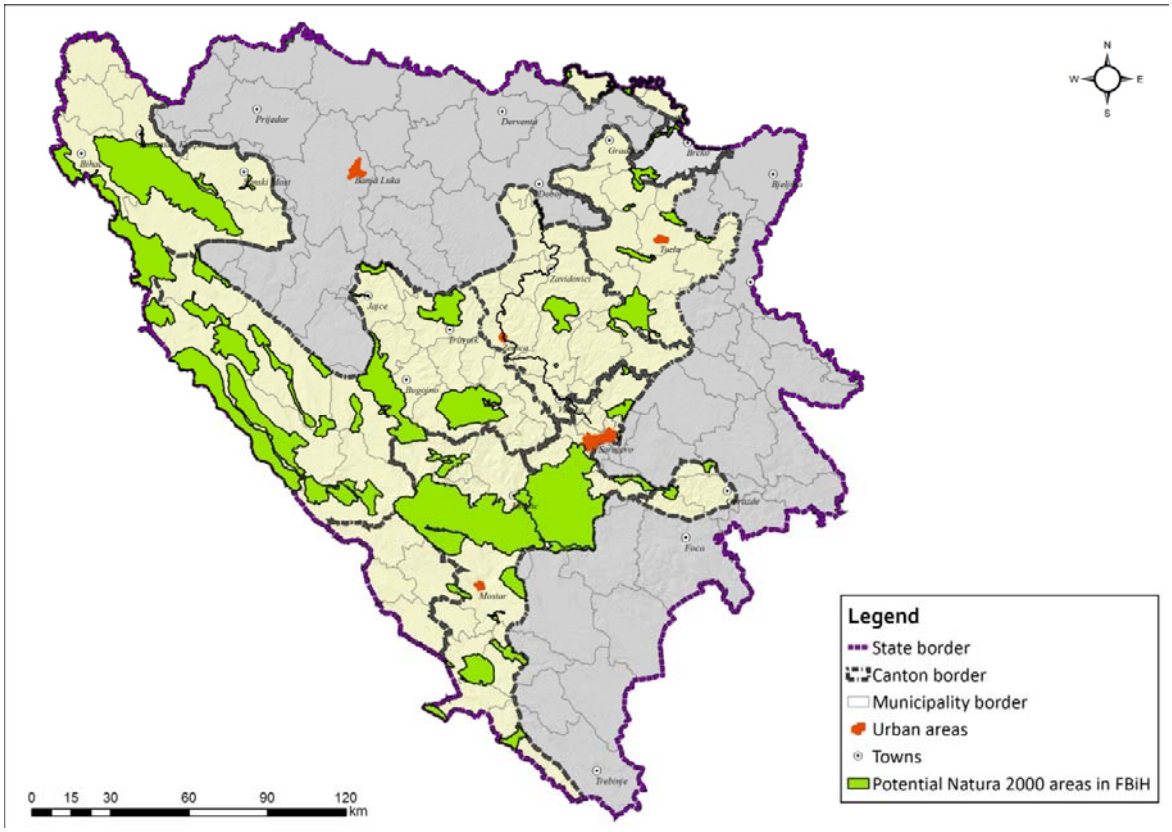


Figure 15: Potential Natura 2000 sites in FBiH

3.7 Cultural and Historical Heritage

The cultural and civilizational waves on the territory of today's FBiH have interlaced and reconciled, manifesting the specific historical coexistence of opposite and cultural differences. Due to the mineral resources and the favorable geographic position, different cultures and civilizations have come and gone in this area, each of which has left significant monumental buildings that testify to the distant past. It started with the emergence of Illyrian civilization, which evolved into the Bosnia Kingdom. The kingdom eventually became an annexation of the Ottoman Empire and later, the Austro-Hungarian Monarchy. Long years of war followed, from WWI to the fight for independence in the mid-1990's. The Historical Museum of BiH (Sarajevo) contains nearly half a million historical artifacts that epitomize the long, gruesome and rich history of the entity. More interesting relics can be found in the Museum of the National Struggle for Liberation (Jajce).

The are many cultural and historical sites in the FBiH including old fortresses, mosques, churches, old towns, and other sites and structures having archaeological, historical, architectural, religious significance, as well as natural sites with cultural values. According to the List of National Monuments of BiH[47], there are over 200 sites registered in FBiH.

FBiH has one property inscribed on the World Heritage List which is the Old Bridge with the Old Town of Mostar. As of 2020, BiH has recorded ten sites on the tentative list, of which nine are located in FBiH.

Annex A contains the list of cultural and heritage sites in the pre-identified project municipalities.

[47] Commission to Preserve National Monuments of BiH, List of National Monuments of BiH

4 BASELINE SOCIO-ECONOMIC CHARACTERISTICS OF THE PROJECT AREA

4.1 Demography

According to the official results of the 2013 Census, the total population of Bosnia and Herzegovina was 3,531,159 (*Table 6*). RS accounts for 35% of population, FBiH around 63% and BD around 2%.

Table 6: BiH population in 2013, and 2018 estimates

Population	2013	2018 (estimate)
FBiH	2,219,220	2,196,233
RS	1,228,423	1,147,902
BD	83,516	83,234
Total	3,531,159	3,427,369

According to data of the FBiH Institute for Statistics[48] majority of population belongs to 15-64 age group, which accounts for 70.1 percent. Age groups 0-14 and over 65 have similar share of population. In FBiH, 15.1 percent of population belongs to age group over 65, while 14.8 percent belong to age group 0-14 (*Figure 16*).

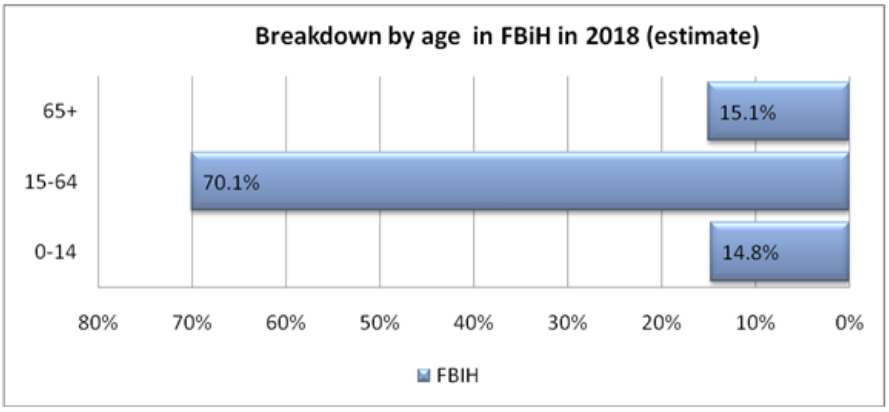


Figure 16: Breakdown by age in FBiH in 2018 (estimate)

For number of years now, population growth rate in BH has been continuously negative. Latest positive one was recorded back in 2008 (*Figure 17*).

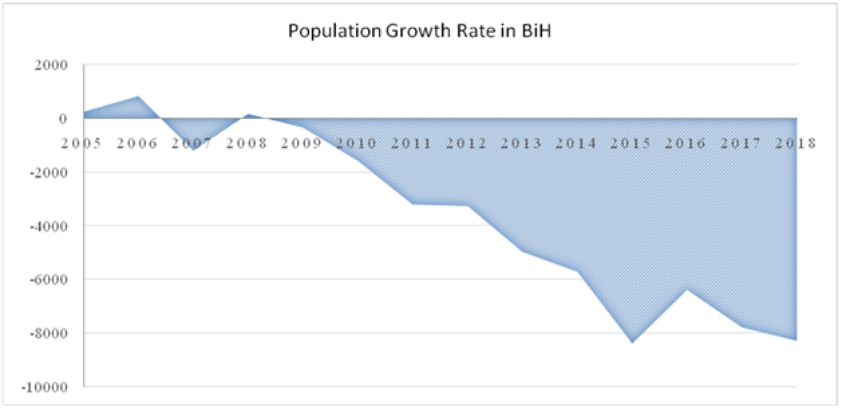


Figure 17: Population Growth Rate in BH

Statistic data in BiH indicate population shrinking trend as well as birth rate drop. According to United Nations Agency for Sexual and Reproductive Health (UNFPA), desirable fertility rate which enables replacement is 2.1.

[48] Source: FBiH Institute for Statistics, 2019

In 2017, in BiH, the number of live births per woman was 1.26 children, which is well below the desirable level[49]. According to United Nations Secretariat[50], BiH population would be 3.4 and 3 million in 2030 and 2050, respectively.

The four Municipalities/Cities will be covered by the Project during the first year of Project implementation are: City of Siroki Brijeg, City of Gracanica, Municipality of Tesanj, Municipality of Citluk. The total number of inhabitants in these Local self-Governments (LSGs) is 135,352 inhabitants (2013 Census). The population density in this area is 143.32 inhabitants/km^2. The Municipality of Tešanj has the highest population density in this area, with 267.90 inhabitants/km^2, and the lowest density is in the City of Siroki Brijeg (74.6 inhabitants/km^2).

According to the presented demographic profile this Project will have a positive social impact on about 135,352 people living in Municipalities/Cities covered by the Project during the first year of Project implementation.

4.2 Rural and Urban Areas

The urban and rural parts of FBiH are considerably different. In FBiH the urban parts include major cities: Sarajevo, Tuzla, Zenica, Mostar, Bihac. In total 69 villages are urban while the rest of FBiH is mainly rural (3.268 rural villages). According to Census 2013, 961.617 (43.3%) FBiH inhabitants live in urban areas, while the rest (1.257.603) lives in rural areas.

The four Municipalities/Cities are characterized by high rate of rural population. Among these Municipality of Citluk has the highest rate of rural population (81.7%), while City of Gracanica has the lowest rate of rural population (78.7%). All these LSGs are formed by one urban village and several rural villages (20 in Citluk, 22 in Gracanica, 33 in Siroki Brijeg and 40 in Tesanj). Only one urban village has more than 5.000 inhabitants and is located in the City of Siroki Brijeg.

4.3 Key Economic Indicators

The key economic indicators for BiH and FBiH are presented in *Table 7*.

Table 7: Key Economic Indicators in BiH and FBiH in the period 2016-2019

Item	Level	2016	2017	2018	2019
Nominal GDP (in BAMmillion)	BiH	30,977	31,376	33,444	35,229
	FBiH	19,540	20,540	21,946	23,131
Nominal growth rate (in %)	BiH	4.4	3.1	3.9	4,34
	FBiH	4.6	5.1	7	5.2
Real growth rate (in %)	BiH	3.3	3.0	3.6	2.68
	FBiH	3.1	3.3	3.9	2.6
GDP per capita for (in BAM)	BiH	8,805	9,057	9,556	10,108
	FBiH	8,857	9,331	10,010	10,562
Average net wage for (in BAM)	BiH	838	851	878	921
	FBiH	839	860	888	923
CPI (Consumer Price Index)	BiH	-1.1	1.3	1.4	0.6
	FBiH	-1.1	1.7	1.6	0.6

Source of 2019 data: BiH Central Bank, BiH Statistics Agency, FBiH Institute for Development Programming

According to the Central Bank's 2019 Annual Report, industrial production has seen the sharpest decline in the last decade. Segmented by industry, the annual decline in industrial production was primarily driven by a sharp decline in manufacturing industry production and by the decrease of electricity and gas production and distribution. Manufacturing of coke and refined petroleum products recorded the strongest impact on the decline of the manufacturing industry, following the overhaul of the oil refinery, and the production of textiles

[49] Source: Agency for Statistics BiH, Demography 2017.

[50] Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat: World Population Prospects 2017, available at: https://population.un.org/wpp/Publications/Files/WPP2017_KeyFindings.pdf, [accessed on: 07 May 2020]

*Estimate/assumption by Economic Planning Directorate according to BH Economic Trends Annual Report, April 2018

and leather products, which rely on the business of the European car industry. Furthermore, in the second part of the year, a sharp decline in the production of base metals was recorded, following the business termination of the strategic company in the field of aluminum processing.

The trends of general prices, measured by the Consumption Price Index, showed significantly lower growth rates. The average annual growth of consumer prices is 0.6% and is the lowest in the region. The labor market, according to administrative data and the 2019 Labor Force Survey data, reports a significantly reduced number of unemployed persons (unemployment rate 15.7%) and increased number of employed persons, with increased demographic changes. Nominal net wages report strong growth, with somewhat slower growth of real net wages.

4.4 Local Economy in Municipalities/Cities covered by the Project during the First Year

Local economy of the four LSGs covered by the Project during the first year of its implementation is mainly based trade, manufacturing and agriculture. The Municipality of Tesanj and the Cities of Siroki Brijeg and Gracanica and the have a well-developed economy based on manufacturing which includes metal processing industry and textile and footwear industry. The industry of the Municipality of Tesanj and the City of Gracanica is also based on leather processing, wood processing and furniture making, and food production (particularly meat production). Food production is also a characteristic of the economy of the Municipality of Citluk. The economy of the City of Siroki Brijeg is also characterized by a strong development of construction/building sector. Agricultural activities are mainly present in the Municipalities of Citluk and the City of Gracanica. The Municipality of Citluk is known for wine production, and this sector contributes to the development of food-based tourism. In the City of Gracanica there are significant areas of farming land where cultivation of fruits and vegetables is the dominant activity. The same applies to livestock production which is focused on specialized types of production (milk, meat).

4.5 Impacts of Climate Change and Water Pollution on Local Economy

Climate change related risks in BiH (mainly droughts, flash floods, landslides and increasing temperatures) are significant and will amplify development challenges in the water sector. In the past years BiH has been experiencing temperature increases of 1.2°C in the summer months and 0.8°C in the winter. Seasonal onset and distribution of rainfall over the past two decades has reportedly been highly variable, causing unexpected flooding and periods of drought, along with high temperatures.[51] Changes in historical precipitation patterns have resulted in increased aridity in agricultural areas, arable lands, low river flow and over-stressed water sources. In fact, the catastrophic floods and landslides in May 2014, affected more than one million people, disrupted the provision of basic services and cost the country more than EUR 2 million in damages and losses, particularly in the agriculture and energy sectors.[52] Significant damage was inflicted on the transport infrastructure (roads, bridges and railways). The assessment of flood damage in BiH in 2014 amounted to about 15% of GDP – damages (9.3%) and losses (5.6%).[53]

In the area the four LSGs covered by the Project during the first year, water resources are used for agricultural activities (especially in Tesanj and Gracanica). Agricultural activities in this area can be negatively affected by the climate change effects such as floods and landslides) and pollution, and negatively impact the food industry which is based on agricultural activities. All area is characterized by the metal processing, leather processing and food production industry which are a source of additional pollution. Possible droughts in the summer months, will have an impact on the potable water supply (particularly affecting rural communities), and on tourism (well developed in the Municipality of Citluk). Economies relying on wood processing and furniture making will also be negatively impacted as climate change is likely to affect the more vulnerable forest ecosystems due to

[51] https://climateknowledgeportal.worldbank.org/country/bosnia-and-herzegovina/climate-data-historical

[52] The estimated cost of the floods in terms of lost output and damages was equivalent to 15 percent of GDP (World Bank, 2015).

[53] BiH Floods. (2014) Recovery Needs Assessment, Ministry of Foreign Affairs of the Grand Duchy of Luxembourg, the EU, UN, WB, and the Global Facility for Disaster Reduction and Recovery

multiple stresses on trees and forest environments, including drought, pest and disease attack, increased fire risks and changes in soil.[54]

4.6 Employment

According to data from the FBiH Institute for Statistics[55], in the last decade number of employed persons in FBiH grew compared to the previous years (*Table 8*). The share of males employed is higher than the share of females employed, however it is slowly decreasing compared to the previous years. In 2019 year the total number of employed persons in FBiH was 531,483. In relation with the previous year the number of employed increased by 2.2% and the number of employed women by 3.3%.

Table 8: Number of employed persons, by gender, in FBiH in 2018 and 2019

Item	2018	2019
Total employed persons	519,800	531.483
Females	41.42%	41.86%
Males	58.58%	58.14%

Source: FBiH Institute for Statistics

The majority of employed people work in the service sector (*Table 9*).

Table 9: Employment by Sectors in FBiH in 2019

Employment sector	Employment rate	Female employment rate	Male employment rate
Agriculture	8.9%	9.6%	8.5%
Industry	35.5%	18.4%	45.7%
Services	55.6%	72.0%	45.7%

Source: FBiH Institute for Statistics

In 2019, there were 313,570 unemployed persons with a decreasing trend compared to the previous years (6.6% less than in 2018). In terms of gender, more women were unemployed than man in 2019, while in other previous two years more men was unemployed than women. The highest share in unemployed persons makes people unemployed for longer than one year. People with completed secondary education account for the highest share of unemployed persons.

Table 10: Unemployed Persons by Gender in FBiH in 2017, 2018 and 2019

Item	2017	2018	2019
General unemployment rate	20,0	19,2	18,4
Female unemployment rate	21,5	21,5	21,7
Male unemployment rate	19,2	17,8	16,3

Source: FBiH Institute for Statistics

4.7 Poverty

According to the 2017 Social Inclusion Report[56], a large share of BiH population is affected by poverty. Children, people with low education, elderly and weak, as well as rural population are the ones who are most likely to live below poverty line.

The key poverty and inequity indicators in BIH (comparative figures for 2011 and 2015), according to the data published by the BiH Statistics Agency, are presented in *Table 11*.

[54] Climate Change Adaptation and Low-Emission Development Strategy for BiH (2013)

[55] First Release on Employment, Unemployment and Wages in FBiH published in 2020, and 2019

[56] 2017 Annual Report, Council of Ministers (Economic Planning Directorate), December 2018

Table 11: Poverty and Inequity Indicators in BiH, 2011 and 2015

	2011	2015
Number of relatively poor households	177,277	170,619
Number of relatively poor individuals	566,025	505,816
Relative poverty rate	17.9%	16.9%
Relative poverty line for single-member household	BAM 416	BAM 389
Absolute poverty rate	15%	-
Poverty gap	25.2	24.6

Source: BiH Statistics Agency

The poverty rate for the elderly (65+) and children (<15years)is higher than the country average. The elderly poverty rate is 19.6%, and the share of children who live in relatively poor households is 18.7%.

4.8 Labor Conditions

Breaches of labor legislation and occupational health and safety legislation are fairly common in BiH. In BiH, the share of informal employment in total employment is relatively high (30 percent)[57]. Informal labor is most common among the young, old, and unskilled workers and in the agricultural sector. In addition, self-employed persons are counted as informally employed. The Association of Independent Trade Unions of BiH has stated that the most common violations of labor rights include (a) preventing workers to use annual leave and (b) avoiding concluding long-term employment contracts and giving preference to fixed-term employment contracts.

In FBiH, an estimated 20 percent of all labor relations are without a legal basis, meaning that labor is performed without signing an employment contract. According to the annual report for 2018 published by the Federal Administration for Inspection Affairs, 2,728 persons were found during inspection activities to be without a regulated labor status. In the same period, 258 serious work-related injuries were recorded (90 of these connected to mining related activities), including 15 deaths (1 of which connected to mining related activities). According to the Presentation of the Results of Performed Activities in 2019 of the Federal Administration for Inspection Affairs, 2,596 informal workers were registered during the inspection activities in 2019. In FBiH, labor inspectors also cover occupational health and safety issues. Unfortunately a new occupational health and safety law is still not adopted which leaves a huge legal gap, knowing that the currently enforced law is from 1990.

4.9 Main Gender and Citizens Engagement Gaps Relevant to this Project

During the development of this ESMF a *Gender Gap and Citizen Engagement Analysis* was prepared as a standalone document. This Analysis focuses on three main issues, as follows:

a) employment opportunities and decision making in WSS Utilities;
b) gender and other social vulnerabilities in utility customer feedback mechanisms (information, satisfaction and opportunity for feedback, complaints resolution, ability to connect to services), and
c) project entry points for strengthening citizen engagement and customer orientation.

Employment Opportunities and Decision Making in WSS Utilities

The Analysis shows that women are overall underrepresented in the BiH water sector (only 22.6% of all workers in consulted WSS utilities in the project area). Gender-based division of jobs is present in the consulted WSS utilities. The range of jobs suitable for women within the utility has expanded to include engineers, but other technical jobs are reserved for men. Of all female employees in the sample WSS utilities, 31.4% are engineers

[57] https://www.ilo.org/budapest/countries-covered/bosnia-herzegovina/WCMS_471903/lang--en/index.htm [accessed on: 27 November 2020]

and managers. The top leading positions are occupied by men (in BiH few WSS utilities directors are women). Gender pay gap does exist but in favor of women as on average women occupy better paid positions. The proposed interventions to increase to enhance women's employment and decision making in the water sector are:

- Annual outreach program designed and conducted in primary and secondary schools to motivate girls and young women to choose technical professions and pursue a career in the water sector,
- Scholarship program targeting girls attending technical and general secondary schools,
- Internships in the WSS Utility offered to students of the final year in the technical schools have balanced participation from women and men,
- Establishment of the gender balanced recruitment committees in utilities,
- Capacity building plans for staff and managers include a goal of gender sensitization for the purpose of eliminating unconscious gender biases/indirect discrimination,
- Infrastructure improvements should provide for separate sanitation facilities for women and men,
- Promotion process and promotion criteria are specified and made known to all.

Gender and Other Social Vulnerabilities in Utility Customer Feedback Mechanisms

Both stakeholders and the WSS utility representatives report a high level of mutual communication on the issues of customers' immediate concern (such as water bills, disconnections, leaks). The channels of communication are primarily in-person contacts on the utility premises, then via telephone, and also electronically via email and Viber. The citizens' perception is that a two-way communication with their WSS utility exists, although they think that the utility could take into consideration more of their suggestions. An important issue is that citizens generally do not know enough about the problems that affect the sector, from the persistent lack of resources for operation and maintenance to low tariffs that do not cover costs and the subsequent regular budget transfers to mitigate losses from the utilities.

Grievance redress mechanisms (GRMs) exist in surveyed WSS utilities but not all are sufficiently robust. They are formal accountability mechanisms for citizens to give feedback on public services when problems arise. Feedback and complaints by individuals are allowed and can be made by email, by phone and in person. The most efficient procedure is perceived to be through direct contact, visiting the utility. Feedback is also collected in a survey and the utilities report to aggregate it and use for improving the services.

Women participate in the local decision-making mechanisms to a significant extent. As reported in the Analysis, Citizens' consultation meetings should be gender balanced and women should be explicitly invited to participate in policy dialogue. The WSS utilities can ensure that women's organizations and other organizations, such as youth and pensioners, are reached for dissemination of invitations and ensuring wide citizens' representations. Alternatively, smaller and more focused consultation events can be held in order to encourage women's participation, particularly of women from vulnerable groups, where they can feel freer to speak.

Project Entry Points for Strengthening Citizen Engagement and Customer Orientation

Local Communities (LCs) (in local language Mjesne Zajednice) are active in holding public meetings on different issues concerning their community and participate in meetings held by other organizations. The WSS utility representatives participate in those meetings when it is necessary to solve some specific problem such as planning improvements, changes, alternative solutions and citizens ask them questions. LCs have recently had success in engaging more women and youth on the projects designed based on their needs and are perceived as centers of direct citizen participation in democratic processes.

Consultative meetings have a potential of creating long-term policy dialogue between citizens and WSS utility. They can be facilitated by the LCs or CSOs. These meetings should be regular, at least four times a year, and well structured, resulting in an action plan that will be result-oriented and will identify actors responsible for their

implementation. In addition, focus groups and community score cards can be introduced for gathering feedback from service users and improve communication between communities and service providers.

4.10 Gender-based Violence, Sexual Harassment, Sexual Exploitation and Abuse

According to the findings from the research conducted by OSCE[58] in 2018, the issue of violence against women is a fairly widespread concern in BiH. This study emphasizes that just under half (48%) of women in BiH have experienced some form of abuse, sexual harassment since the age of 15. More specifically, nearly four in ten (38%) say they have experienced psychological, physical or sexual violence since the age of 15 at the hands of a partner or non-partner (FBiH: 36%, RS: 39%). However, significantly fewer women said they experienced violence compared to women in the EU, with 35% experiencing psychological (43% in the EU), 10% physical (20% in the EU) and 4% sexual violence (7% in the EU) at the hands of partner.[59] BiH has ratified or inherited a number of international commitments on gender equality and GBV prevention, including the UN Convention on the Elimination of All Forms of Discrimination against Women (1980) and the Council of Europe's Istanbul Convention on Preventing and Combating Violence against Women (2013).

4.11 Vulnerable Groups

Disadvantaged / vulnerable individuals or groups are potentially disproportionally affected and less able to benefit from opportunities offered by the project due to specific difficulties to access and/or understand information about the project and its environmental and social impacts and mitigation strategies. Such groups are also more likely to be excluded from the consultation process. Such groups are also more likely to be excluded from the consultation process. It also includes groups who may be difficult to reach due to communication barriers (language, illiteracy) and those who are in the informal housing market or informal economy and those who are very poor and may find it hard to pay regular tariffs.

Disadvantaged / vulnerable individuals or groups in the project area include "low-income households"; women; youth; women-headed households; elder-headed households (≥ pension age) without any other household member bringing in income; persons with limited mobility; or persons with disabilities; women in rural communities, Roma groups, individuals and habitat communities. Various types of barriers may influence the capacity of such groups to articulate their concerns and priorities about project impacts. The Roma population is categorized among the most vulnerable social groups, and Roma women, in particular, as they are less educated than Roma men. In case they have a job, which is very rare, it is usually some unregistered and lower paid job. Many Roma families have been severely affected by economic consequences of the covid-19 pandemic as they have lost their precarious jobs. Women in many rural communities wash clothes by hand in addition to other domestic chores. Even if they live in the vicinity of the water or sanitation system, some low-income families do not have a connection to such systems. Persons with disabilities in one of the sample municipalities are said to be living in very poor conditions and are often cut-off from water supply due to accumulated unpaid. Elderly citizens, men and women of 65 and older can be a good but underrated target group for citizen engagement.

Vulnerable groups within the communities affected by the project will be further confirmed and consulted through dedicated means, as appropriate. Description of the methods of engagement that will be undertaken by the project is provided in the SEP developed for this Project.

[58] OSCE-led Survey on Violence Against Women, BiH Results Report, 2019

[59] Ibid.

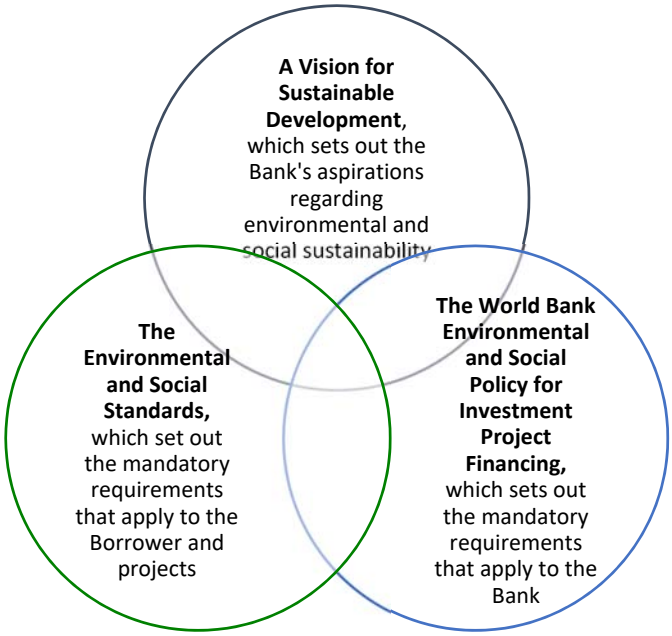
5 LEGAL FRAMEWORK

5.1 The World Bank Requirements

5.1.1 The World Bank Environmental and Social Framework (2016)

World Bank Environmental and Social Framework

WB's Environmental and Social Framework (2016)[60] became effective in October 2018. The Framework sets out the Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity. The Bank's Framework consists of three parts:



Risk Classification

The Bank classifies all projects into one of four classifications:

- High risk
- Substantial risk
- Moderate risk
- Low risk.

In determining appropriate risk classification, the Bank takes into account relevant issues such as:

- Type, location, sensitivity and scale of the project,
- Nature and magnitude of potential environmental and social risks and impacts,
- The capacity and commitment of the Borrower (including any other entity responsible for the implementation of the project) to manage the E&S risks and impacts in a manner consistent with the ESSs.

Other areas of risk may also be relevant to the delivery of E&S mitigation measures and outcomes, depending on the specific project and the context in which it is being developed. These could include legal and institutional

[60] Available in English at: http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf

considerations; the nature of the mitigation and technology being proposed; governance structures and legislation; and considerations relating to stability, conflict or security.

Projects involving multiple small subprojects

For projects involving multiple small subprojects, that are identified, prepared and implemented during the course of the project, the Bank will review the adequacy of national E&S requirements relevant to the subprojects, and assess the capacity of Borrower to manage the E&S risks and impacts of subprojects. When necessary, the project will include measures to strengthen the capacity of the Borrower.

The Borrower is required to carry out appropriate E&S assessment of subprojects, and prepare and implement such subprojects, as follows:

(a) High risk subprojects, in accordance with ESSs;

(b) Substantial, moderate and low risk subprojects, in accordance with national law and any requirement of the ESSs that the Bank deems relevant for such subprojects.

Environmental and Social Standards

The Bank is committed to supporting Borrowers in the development and implementation of projects that are environmentally and socially sustainable, and to enhancing the capacity of Borrowers E&S frameworks to assess and manage the E&S risks and impacts of projects. To this end, the Bank has defined specific ESSs, which are designed to avoid, minimize, reduce or mitigate the adverse E&S risks and impacts of projects. The desired outcomes are described in the objectives of each ESS, followed by specific requirements to help Borrowers achieve them. The projects supported by the Bank must comply with the following ESSs:

Environmental & Social Standard 1	• Assessment and Management of Environmental and Social Risks and Impacts
Environmental & Social Standard 2	• Labor and Working Conditions
Environmental & Social Standard 3	• Resource Efficiency and Pollution Prevention and Management
Environmental & Social Standard 4	• Community Health and Safety
Environmental & Social Standard 5	• Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
Environmental & Social Standard 6	• Biodiversity Conservation and Sustainable Management of Living Natural Resources
Environmental & Social Standard 7	• Indigenous Peoples
Environmental & Social Standard 8	• Cultural Heritage
Environmental & Social Standard 9	• Financial Intermediaries
Environmental & Social Standard 10	• Stakeholder Engagement and Information Disclosure

These ESSs are accompanied by non-binding Guidelines, Best Practice Notes, Templates and Checklists[61].

Standards applicable to this Project are described in more details below.

Environmental and Social Standard 1 – Assessment and Management of E&S Risks and Impacts is applied to all projects supported by the Bank through Investment Project Financing. The objective is to identify, evaluate and manage E&S risks and impacts associated with each stage of project, in order to achieve E&S outcomes consistent with Bank requirements. ESS1 is also applied to all Associated Facilities/Activities which must meet ESSs requirements to the extent that the Borrower has control or influence over such Associated Facilities/Activities.[62]

Within ESS1, the Borrower is obliged to:

- Conduct an E&S assessment of the propose project, including stakeholder engagement,
- Undertake stakeholder engagement and disclose appropriate information in accordance with ESS10,
- Develop an Environmental and Social Commitment Plan (ESCP) and implement all measures and actions set out in the legal agreement including the ESCP,
- Conduct monitoring and reporting on the environmental and social performance of the project against the ESSs.

The aim of the requirements set out in ESS1 is to help Borrowers plan and design project, manage project risks and impacts in a systematic way.

The environmental and social assessment will be proportionate to the risks and impacts of the project and will assess in an integrated way all relevant direct, indirect and cumulative E&S risks and impacts throughout project life cycle, including those specifically identified in the ESS2-10. Also, ways of improving project selection, siting, planning, design and implementation will be identified in order to apply hierarchy of mitigation and create opportunities to enhance the positive impacts. The E&S assessment process shall apply mitigation hierarchy according to which: (a) risks and adverse impacts needs to be anticipated and to the extent possible avoided, while positive impacts and benefits for the community and physical environment need to be maximized, (b) where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; (c) residual adverse impacts and risks need to be removed or mitigated to the acceptable level; (d) where significant residual impacts remain, compensate where technically and financially feasible.

For projects which involve a set of subprojects, identified, prepared and implemented during the Project, environmental and social assessment is carried out using the instrument of Environmental and Social Management Framework (ESMF). The ESMF sets out the principles, rules, guidelines and procedures to assess the environmental and social risks and impacts of any future subprojects.

Environmental and Social Standard 2 – Labor and Working Conditions regulates working conditions, and scope of its application depends on type of employment relations between the Borrower and project workers. The term “project worker” is related to:

a) people employed or engaged directly by the Borrower (including the project proponent and the project implementing agencies) to work specifically in relation to the project (direct workers);
b) people employed or engaged through third parties to perform work related to core functions of the project, regardless of location (contracted workers);

[61] Available in English at: http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-framework-resources#guidancenotes

[62] The term “Associated Facilities” means facilities or activities that are not funded as part of the project and are: (a) directly and significantly related to the project; (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist. For a facility or an activity to be defines as associated facility, all three criteria must be fulfilled.

c) people employed or engaged by the Borrower's primary suppliers (primary supply workers); and
d) people employed or engaged in providing community labor (community workers).

ESS2 objectives are:

- To promote safety and health at work.
- To promote the fair treatment, nondiscrimination and equal opportunity of project workers.
- To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers.
- To prevent the use of all forms of forced labor and child labor.
- To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law.
- To provide project workers with accessible means to raise workplace concerns.

Environmental and Social Standard 3 - Resource Efficiency and Pollution Prevention and Management sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle consistent with Good International Industrial Practice. Applicability of this EES is established during environmental and social assessment.

ESS3 objectives are:

- To promote the sustainable use of resources, including energy, water and raw material.
- To avoid or minimize adverse impact on human health and the environment by avoiding or minimizing pollution from project activities.
- To avoid or minimize project-related emissions of short and long-lived climate pollutants.
- To avoid or minimize generation of hazardous and non-hazardous waste.
- To minimize and manage the risks and impacts associated with pesticide use.

The Borrower shall be obliged to apply technically and financially feasible measures to improve efficient consumption of energy, water and raw material, as well as other resources. Such measures shall integrate cleaner production principles into the product design and production processes in order to conserve raw material, energy, water and other resources.

Besides, the Borrower will avoid the release of pollutants or, when avoidance is not feasible, minimize and control the concentration and mass flow of their release using the performance levels and measures specified in national law or the World Bank Group Environmental, Health and Safety Guidelines[63], whichever is most stringent. This applies to the release of pollutants to air, water and land due to routine, non-routine, and accidental circumstances, and with the potential for local, regional, and transboundary impacts.

Pollution prevention and management includes management of:

- Air pollution
- Hazardous and non-hazardous waste
- Chemicals and hazardous material
- Pesticides.

[63] World Bank Group Environmental, Health and Safety Guidelines (EHSG), available at: https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/EHS-Guidelines/

Environmental and Social Standard 4 – Community Health and Safety addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable.

Objectives of ESS4 are the following:

- To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances.
- To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams.
- To avoid or minimize community exposure to project-related traffic and road safety risks, dis-eases and hazardous materials.
- To have in place effective measures to address emergency events.
- To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.

Environmental and Social Standard 5 – Land Acquisition, Restriction on Land Use and Involuntarily Resettlement is applicable to this project. A Resettlement Policy Framework has been developed and any subproject involving land acquisition and involuntary resettlement, regardless of whether physical relocation is present, will develop a Resettlement Plan as per the RPF and this will be approved by the World Bank and disclosed in-country. The screening process will screen for all the subprojects which may involve involuntary land acquisition.

Environmental and Social Standard 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources is applicable to all projects that potentially affect biodiversity or habitats, either positively or negatively, directly or indirectly, or that depend upon biodiversity for their success. It is also applied to projects that involve primary production and/or harvesting of living natural resources[64].

ESS6 objectives are:

- To protect and conserve biodiversity and habitats.
- To apply the mitigation hierarchy in the design and implementation of projects that could have an impact on biodiversity.
- To promote the sustainable management of living natural resources.
- To support livelihoods of local community.
- To avoid or minimize generation of hazardous and non-hazardous waste.

The Borrower is obliged to avoid adverse impacts on bio-diversity and habitats. When avoidance of adverse impacts is not possible, the Borrower will implement measures to minimize adverse impacts and restore biodiversity in accordance with the mitigation hierarchy provided in ESS1 and with the requirements of this ESS. Where significant risks and adverse impacts on biodiversity have been identified, the Borrower will develop and implement a Biodiversity Management Plan[65]. A Biodiversity Management Plan (BMP) includes key biodiversity objectives, activities to achieve the objectives, an implementation schedule, institutional and gender-inclusive responsibilities, cost and resourcing estimates.

[64] Harvesting of living natural resources, such as fish and all other types of aquatic and terrestrial organisms and timber, refers to productive activities that include extraction of these resources from natural and modified ecosystems and habitats.

[65] Depending on the nature and the scale of the risks and impacts, to address cultural heritage as an integral aspect of sustainable development the project, the Biodiversity Management Plan may be a stand-alone document or it may be included as part of the Environmental and Social Commitment Plan prepared under ESS1.

Environmental and Social Standard 7 – Indigenous Peoples is not applicable to this Project given the fact that in Bosnia and Herzegovina, there are no any social or cultural groups of specific characteristics defined in ESS7.

Environmental and Social Standard 8 – Cultural Heritage sets out general provisions on risks and impacts to cultural heritage from project activities. The term "cultural heritage" encompasses tangible and intangible heritage, which may be recognized and valued at a local, regional, national and global level. Cultural heritage provides continuity in tangible and intangible forms between the past, present and future.

Objective of ESS8 are the following:

- To promote the equitable sharing of benefits from the use of cultural heritage.
- To address cultural heritage as an integral aspect of sustainable development.
- To promote meaningful consultation with stake-holders regarding cultural heritage.
- To protect cultural heritage from the adverse impacts of project activities and support its preservation.

The requirements of this ESS8 will apply to all projects that are likely to have risks or impacts on cultural heritage. This will include a project which:

a) Involves excavations, demolition, movement of earth, flooding or other changes in the physical environment;
b) Is located within a legally protected area or a legally defined buffer zone;
c) Is located in, or in the vicinity of, a recognized cultural heritage site;
d) Is specifically designed to support the conservation, management and use of cultural heritage.

Environmental and Social Standard 9 – Financial Intermediaries is not applicable to this Project.

Environmental and Social Standard 10 – Stakeholder Engagement and Information Disclosure recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.
ESS10 objectives are the following:

- To establish a systematic approach for stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.
- To assess the level of stakeholder interest and support for the project and to enable stake-holders' views to be taken into account in project design and environmental and social performance.
- To promote and provide means for effective and inclusive engagement with project-affected par-ties throughout the project life cycle on issues that could potentially affect them.
- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.

To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances.

5.2 Overview of Environmental and Social Requirements

5.2.1 Environmental Assessment Procedure

Responsibility for the Environmental Impact Assessment (EIA) procedure in FBiH is shared between the Federation and Cantonal Ministries responsible for the environment (for the list of cantonal ministries

responsible for environmental issues, please refer to Annex B; the details about institutional framework of the regulatory agencies that are responsible for E&S related aspects in the country are given in Chapter 6). In FBiH, the procedure for issuing Environmental Permits is prescribed by:

- the Law on Environmental Protection[66],
- the Regulation on Plants and Facilities Subject to EIA, and Plants and Facilities which May Be Constructed and Commissioned Only If They Have an Environmental Permit[67] (the FBiH Regulation).

The FBiH Regulation specifies the following:

- Plants and facilities subject to EIA,
- Plants and facilities for which the Federal Ministry of Environment and Tourism (FMET) determines whether an EIA must be conducted, as well as
- Plant and facilities which do not need an EIA, and for which the Federal Ministry issues the Environmental Permit.

For plants and facilities subject to an EIA the assessment procedure begins by submitting an Environmental Impact Assessment Study (EIA Study) to FMET. FMET publicly disclosed the EIA Study through its website, informs and invites the general public to public consultation, and appoints an expert committee to evaluate the EIA Study. After completion of the public consultation process and evaluation by the expert committee, FMET issues a Decision on Approval or Rejection of the EIA Study. In case of approval, FMET issues a Decision on Granting of the Environmental Permit. In case of rejection, the procedure is terminated.

For plants and facilities for which FMET determines whether they need an EIA the procedure begins by development and submission of an Application for Obtaining an Environmental Permit. FMET forwards the Application accompanied by supporting documentation to the responsible authorities and interested stakeholders to obtain their opinions. When considering the Application, FMET takes into account the following criteria:

- Project characteristics (size, relations with other facilities, use of natural resources, waste generation, risk of accidents…),
- Project location and sensitivity of adjacent geographic area which is likely to be affected by the project (current use of land, availability, quality and regeneration capacity of natural resources, absorption capacity of surrounding nature: wetland, coastal zone, protected area, etc.),
- Characteristics of potential impacts (scope of impact, trans-boundary nature of impact, magnitude and complexity, likelihood, duration, frequency and reversibility).

In case the project site is within a zone under any type of protection regime as regulated by the Law on Waters (water protection zone) or Law on Nature Protection, then the assessment is mandatory in order to check compliance of the proposed activities with protection regimes and potential impacts.

If it is established, based on the Environmental Permit and the attached evidence, that there is no need for an EIA Study, FMET issues a Decision on Granting the Environmental Permit. Otherwise, it issues a Conclusion on the Need to Develop an EIA Study. The EIA Study development involves mandatory public consultations, and the study is evaluated by a technical committee.

For plants and facilities which do not need an EIA, and for which FMET issues an Environmental Permit, the environmental permitting procedure begins by submitting to FMET an Application for Obtaining an Environmental Permit, and FMET is obliged to issue the Permit within 120 days.

[66] Official Gazette of FBiH, No. 33/03 and 38/09
[67] Official Gazette of FBiH, No. 19/04

For projects, plants and facilities which can be constructed and commissioned only if they have an Environmental Permit, and which fall under Cantonal level responsibility based on their capacity and size, it is necessary to prepare an Application for Obtaining an Environmental Permit. The Application is submitted to the responsible Cantonal Ministry of Environment, which is obliged to disclose the Application on its website, and to forward copies of the Application to interested stakeholders for suggestions and comments in order to ensure public participation. The Environmental Permit is issued based on the Application.

The FBiH Regulation specifies that environmental assessment shall be carried out for the following types of activities: a) activities that involve abstraction of water and b) construction of wastewater treatment plant. The level of assessment depend on the volume of water abstracted or capacity of a wastewater treatment plant. In case that the expansion of existing WTP/WWTP is greater than 25% the opinion of the ministry of environment on the necessary of environmental impact assessment procedure needs to be sought.

The specific environmental assessment and permitting requirements for the WSSM Project and categories of sub-projects are described in Chapter 7.3 Environmental and Social Requirements for the Project including comparison between the national requirements and the ESF risk rating.

5.2.2 Waste Management Regulations

In FBiH, pursuant to the *Law on Waste Management*[68], the Environmental Permit Application must be accompanied by a Waste Management Plan. The Plan contains the following:

- Documentation on the waste generated by the company (origin, type of waste pursuant to waste classification list, composition, volume),
- Measures to be taken to limit waste generation, particularly in case of hazardous waste,
- Separation of waste, particularly separation of hazardous waste from other types of waste and from recyclables,
- Waste disposal practices,
- Waste treatment and/or disposal methods.

In addition, according to the *Regulation on Construction Waste*[69] a Preliminary Construction Waste Management Plan needs to be submitted for the issuance of the Urban Permit, while a Detailed Construction Waste Management Plan must be enclosed to the Construction Permit Request.

The Regulation on Waste Categories with Lists[70] defines waste categories by activities. Some waste categories which may be generated as a result of activities potentially included in this Project are provided below.

Table 12: Waste Generated by the Activities Potentially Included by the Project – FBiH

Activity from which the Waste Originates	Regulation Code
Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	02 00 00
Waste from the production, formulation, sale and application of coatings (paints, varnishes and glass enamels), adhesives, sealants and printing inks	08 00 00
Waste liquid fuels and oils (excluding edible oils, 05 and 12)	13 00 00
Packaging waste, absorbents, absorbent materials, filter materials and protective clothing not otherwise specified	15 00 00
Waste not otherwise specified in the catalogue	16 00 00
Construction waste and demolition waste	17 00 00
Waste from waste management plants, urban waste water treatment plants and drinking water treatment plants and industrial use	19 00 00
Municipal waste and similar waste from industrial facilities and small craft, including separately collected fractions	20 00 00

[68] Official Gazette of FBiH, No. 33/03, 72/09 and 92/17
[69] Official Gazette of FBiH, No. 93/19
[70] Official Gazette of FBiH, No. 9/05

5.2.3 Water Management Regulations

In FBiH, the *Law on Water*[71] was passed in 2006. The Law prescribes the obligation to adopt the Water Management Strategy (Strategy) which, in the broadest sense, defines the water management policy of the FBiH. The Strategy in the FBiH is adopted for the period 2010-2022.

Responsibilities regarding water supply for the population are divided between the FBiH and the cantons. The FBiH enacts regulations on the quality of water for human use and regulations related to effluents, while the development and legal regulation of issues related to the use and maintenance of infrastructure for drinking water supply and wastewater elimination is the exclusive competence of the canton.

The *Law on Water* prescribes that in case of a project which includes e.g. construction of flood protection facilities, as well as any other activity which may affect volume and quality of water, the following water management acts must be obtained:

- *Preliminary Water Approval*, which prescribes the terms and conditions under which the responsible Ministry will allow use of water (issued in the stage of Urban Permit).
- *Water Approval*, which confirms that the documentation attached to the Application for Water Approval is in compliance with the Preliminary Water Approval and Water Guidelines in FBiH respectively, water regulations and planning documents (issued before the Construction Permit).
- *Water Permit*, which confirms that all the requirements set in the Water Approval are met (issued before the Use Permit). The Water Permit defines purpose, terms and conditions of water use, facility and plant operating regime, terms and conditions of wastewater discharge, terms and condition of solid waste and liquid waste disposal and other terms and conditions. It also defines the applicant's obligations related to wastewater measurement, measurement frequency, quality control and records keeping on used water, as well as obligations related to water fees accounting and payment.

In FBiH, water documentation is issued pursuant to the Regulation on Content, Form, Terms and Conditions and Manner of Issuance and Keeping of Water Documentation[72].

The entity law on water foresees that the Environmental Permit is issued based on the previously obtained Preliminary Water Approval/Water Guidelines. It is thus ensured that the environmental ministry can integrate in the Environmental Permit any water protection-related recommendations and measures.

In FBiH, the Sava River Water Agency, the Adriatic Sea Water Agency and Cantonal Ministries are responsible for issuing water documentation (for the list of cantonal ministries responsible for water issues, please refer to Annex B).

The specific permitting requirements for the WSSM Project and categories of sub-projects are described in Chapter 7.3 Environmental and Social Requirements for the Project.

5.2.4 Construction Regulations

In FBiH, construction is governed by the following legislation:

- The Law on Physical Planning and Land Use at FBiH level[73]
- Cantonal Laws on Physical Planning and Construction.

Pursuant to the Federation and Cantonal regulations on physical planning and construction, in order to construct facilities, it is necessary to obtain an Urban Permit, Construction Permit and Use Permit. Depending on the type of construction, these permits are issued by the Federal Ministry of Spatial Planning, the Cantonal Ministries relevant for spatial planning, or by the local self-government units (Cities or Municipalities).

[71] Official Gazette of FBiH, No. 70/06

[72] Official Gazette of FBiH, No. 06/08, 57/09 and 72/09

[73] Official Gazette of FBiH, No. 2/06, 72/07, 32/08, 4/10, 13/10, 45/10

The Decree on Construction Site Organization, Mandatory Documentation on Construction Site and Construction Work Participants[74] specifies the documents that must be kept at construction sites, including a Construction Site Organization Plan (CSOP). The CSOP contains the following:

- Description of preparatory works and site arrangements works during and after construction works,
- Description of technological scheme,
- Management Plan on Safety (composed of Occupational Safety Management Plan and Fire Fighting and Explosion Management Plan),
- Environmental Management Plan during construction works.

The CSOP must be developed by the Contractor for construction works prior to the commencement of construction works. It has to be controlled and signed by the Supervision Engineering Authority which is the legal entity responsible for the overall supervision of construction works, as stipulated by the above-mentioned Decree. The Plan should correspond to the requirements, safety measures and obligations contained in the Environmental Permit or environmental requirements laid down in the approval process for the construction.

The specific permitting requirements for the WSSM Project and categories of sub-projects are described in Chapter 7.3 Environmental and Social Requirements for the Project.

5.2.5 Land Acquisition

Land acquisition in FBiH is regulated by the Law on Expropriation of FBiH[75] which defines the conditions and procedure for expropriation of property for construction of facilities in public interest, compensation eligibility and amounts, handling of grievances and disputes handling and other issues pertaining to the expropriation process. The details about requirements of this Law are given in the Resettlement Policy Framework developed for this Project.

5.2.6 Labor Regulations

FBiH Labor Law[76] regulates conclusion of employment contract, working hours, salary, work contract termination, right and obligations under employment contracts and collective bargaining. The Law, inter alia, treats rights of worker and employer to enter employment contract, rights of minor and female workers, safety and health at work. Provisions of this Law are harmonized with ILO Conventions on forced work, discrimination, child work, equal pay, freedom of association, freedom of organization and collective bargaining.

The key provisions of the **Labor Law** in FBiH are as follows:

- **Employment contracts** can be concluded as **open ended or fix-term**, part-time, for temporary and occasional work, as well as for work outside of the employer's premises. The Law prescribes the terms and condition and duration of such contracts.
- The Law **prohibits discrimination** in terms of employment requirements and selection of candidates, education, training and professional development, promotion and employment contract termination. Pregnancy and maternity leave cannot be a reason not to hire a woman or extend her employment contract.
- The Law prescribes the **minimum employment age** of 18 for concluding an employment contract, with exception of allowing persons between 15 and 18, with the consent of their legal custodians and based on a medical certificate issued by health facility, and provided that the given job does not endanger the minor's health, moral and education.
- **Employers are required** to register workers for pension and disability, health and unemployment insurance.

[74] Official Gazette of FBiH, No. 48/09, 75/09, 93/12, 74/13, 89/14. 99/14, 53/15 and 101/15
[75] Official Gazette of FBiH, No. 70/07, 36/10, 25/12 and 34/16
[76] Official Gazette of FBiH, No. 26/16 and 89/18

- **Workers are entitled** to a salary and salary compensation during absence from work, as well as to working conditions which ensure safety and protection of their life and health at work.
- **Full time work** is, as a rule, 40 hours a week. **Overtime** work is allowed, in the duration of maximum 8 hours a week.
- Workers are entitled to an **increased** salary for overtime, night work and work during holidays.
- The Law defines in detail **breaks** from work to which workers are entitled (breaks during working hours, daily, weekly and annual leave).
- The Law foresees that a worker who believes that the employer violated any of his/her employment-related rights can **request from the employer to provide him/her with such right**. It does not specify a deadline for the employer to respond to this request. It also envisages a mechanism of **amicable dispute resolution** as well as **lodging court suits**[77].

There are no key gaps between WB requirements and the FBiH Labor Law with the exception of the requirement to have in place a grievance redress mechanism for raising workplace concerns for some categories of workers (i.e. external consultants as direct workers recruited by PIU or contracted workers). These gaps have been identified and addressed in the LMP for this Project.

5.2.7 Safety at Work Regulation

FBiH Law on Protection and Safety at Work[78] regulates safety at work measures which include measures that directly ensure the safety and health of workers at work, risk assessment at work, prevention of injuries at work, occupational diseases and other diseases that occur in close connection with work, obligations and rights of workers, obligations of employers, as well as health and inspection supervision.

The key provisions of the **Law on Protection and Safety at Work** in FBiH are as follows:

- Employers are obliged to **ensure OHS and provide the necessary means** to implement and improve OHS, as well as to organize theoretical and practical **OHS training** for workers,
- Workers must be provided with a working environment, assets for work and personal protection equipment that do not endanger the safety or health of workers and other persons,
- Workers are obliged to use personal protection equipment and comply with other instructions related to safety at work,
- Employers are required to conduct **risk assessments** for each job and to adopt **an internal OHS regulation**,
- Employers with high-risk activities must designate at least one **OHS Officer** who is responsible for issuing instructions on safe work and monitoring the application of OHS measures. In addition, employers with 30 or more workers must have an **OHS Commissioner** (appointed by the workers or the trade union) who monitors the employer's OHS performance.

There are no key gaps between WB requirements and the FBiH Law on Protection and Safety at Work. More details on this Law are provided in the LMP for this Project.

[77] According to the survey published on the website of the Initiative for Monitoring European Integrations in BiH, average duration of employment-related disputes in BiH is 313 days (source: Initiative for Monitoring European Integrations in BIH) http://eu-monitoring.ba/trajanje-sudskih-postupaka-u-antidiskriminacijskim-predmetima/#_ftn7 [accessed on: September 29, 2019]. Although, pursuant to Litigation Procedure Law, employment-related disputes are considered to be of urgent nature, they last several years and have negative implications on economic position.

[78] Official Gazette of FBiH, No. 79/20

6 INSTITUTIONAL STRUCTURE

6.1 BiH Level Institutions

According to the Dayton Agreement, issues such as foreign policy, foreign trade policy and customs policy fall within the area of competence of BiH institutions. All governmental functions and authorities that are not expressly assigned to the institutions of BiH, are those of the entities/District. This includes water management, environmental protection, agriculture, land and forestry. However, the national level does have some competences in the fields related to implementation of international treaties, environmental protection and water management.

The aforementioned FBiH Law on Water states that water management is the responsibility of BiH, the Federation, the canton, the city and the municipality. At the state level, the Ministry of Foreign Trade and Economic Relations (MoFTER) is responsible for, among others, tasks and duties falling within the competence of BiH which are related to definition of policy, basic principles, coordination of activities and harmonization of plans of entity-level authorities and institutions on the international level in the areas of agriculture, energy, environmental protection, development and use of natural resources and tourism. In relation to water management, the Water Resources Department within MoFTER contributes, through regional and international cooperation, as well as cooperation with entity institutions, to better management and use of water resources in BiH and wider.

BiH is a signatory to several conventions and protocols in this area, among which are the Convention on the Protection and Sustainable Use of the Danube River and the Framework Agreement on the Sava River Basin, with a number of related protocols. The Water Resources Department is actively involved in the implementation of the mentioned agreements. In addition, this Department participates in the implementation of a number of projects in the country as well as at the regional level, which contribute to the sustainable management of water resources in BiH.

6.2 FBiH Level Institutions

Pursuant to the FBiH Constitution[79], water management and environmental protection policy is under the joint responsibility of FBiH and cantons.

Table 13 provides an overview of institutions and their responsibilities relevant for this Project. For the list of cantonal ministries responsible for water management and environmental issues, please refer to Annex B.

Table 13: FBiH level institutions responsible for water management and environmental issues relevant for this Project

Institution	Responsibilities
Federal Ministry of Agriculture, Water Management and Forestry (FMAWMF)	Performs administrative, professional and other tasks in the field of water management, management of the basins among which are: preparation of strategies and development policies for water management, water management facilities and public water properties, proposing development documents for the integrated water management, preparation of legislation and regulations and institutional arrangement in the field of water management within the competence of FBiH, coordination of monitoring activities in water resources, implementation of development projects and cooperation with water management institutions and other institutions, carrying out concession granting procedures within the competence of the Ministry in this field, carrying out activities related to

[79] Official Gazette of FBiH, No. 1/94, 13/97, 16/02, 22/02, 52/02, 63/03, 9/04, 20/04, 33/04, 71/05, 72/05 and 88/08.

Institution	Responsibilities
	international contracts, agreements, conventions and protocols in water management.
Water Agencies in FBiH (Sava River Watershed Agency and Adriatic Sea Watershed Agency)	Organize hydrological monitoring and water quality monitoring, monitoring of ecological status of surface waters, monitoring of ground water quality. They prepare reports on the status of water quality and recommend measures necessary for achievement of goals related to water protection of waters, regulation of waters, protection from adverse effects of waters, and use of waters. They issue water-related acts and order measures which entities must observe in the periods of validity of these acts. They establish and manage the water information system.
Federal Ministry of Environment and Tourism (FMET)	Performs administrative, professional and other tasks within the competence of FBiH related to air, water and soil protection; drafting environmental strategy and policy, standards for air, water and soil quality, environmental monitoring and control of air, water and soil. The Ministry is also responsible for issuance of Environmental Permits at FBiH level.
Federal Ministry of Spatial Planning	Responsible for spatial planning and land use at FBiH level, long-term plans for exploitation of natural resources and protection of national monuments and areas of exceptional natural, architectural and cultural and historical importance. Also responsible for issuing Urban Consents, Construction Permits, and Use Permits at FBiH level.
Federal Ministry of Finance	System of financial operations, accounting system, system of insurance of property and persons, system of taxes, contributions and other fees, system of financing public spending, preparation and execution of the FBiH Budget, supervision over the execution of the Federation Budget, cash flow management, daily monitoring of funds.

The project implementation arrangements are briefly described in Chapter 2.1.4 Implementation Arrangements while specific roles and requirements for the staffing are given in Chapter 8.1 Institutional responsibilities.

7 ENVIRONMENTAL AND SOCIAL RISK ASSESSMENT

7.1 ESSs Relevant to the Project

Following is an overview of the WB E&S standards considered applicable to the WSS Modernization Project at the time of the appraisal and a brief explanation of their relevance.

Table 14: ESSs considered relevant for the WSS Modernization Project at the time of the appraisal

ESS		Relevance to the WSSM
ESS1	Assessment and Management of E&S Risks and Impacts	This standard guides the preparation of E&S instruments including those that have been prepared for WSSM Project: (i) ESMF, (ii) SEP, (iii) RPF (iv) LMP and appropriate risk assessment for individual activities implemented under the project.
ESS2	Labor and Working Conditions	This standard guides the creation of sound worker-management relationships. The primary labor risk is the risk of informal work. The risks of unpaid and underpaid work, work overload, poor terms and conditions of engagement, lack of occupational health and safety measures, and denied access to social security, pension or health insurance are associated with informal work. Labor Screening and Compliance Checklist, and Monitoring and Evaluation procedures have been developed to be included as mandatory in the tender documentation providing compliance of third parties i.e. different contractors to the ESS2 requirements.
ESS3	Resource Efficiency and Pollution Prevention and Management	This standard sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle. Considering that most of the activities involve construction works, the major risk is that Contractors will not be aware of best practices to avoid or minimize pollution from project activities or avoid or minimize adverse impacts on human health and the environment. The site-specific ESMP will guide contractors to implement adequate pollution prevention and management measures.
ESS4	Community Health and Safety	This ESS sets out the requirements to avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials and to have in place effective measure to address emergency events. The works anticipated in this project will be carried out mostly in remote or publicly restricted areas and will not employ use or generation of hazardous substances and waste. The main risk associated with the project is related to workers health and safety that is addressed by ESS2.
ESS5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	This ESS guides the procedures to avoid or implement involuntary resettlement and economic displacement with least possible impacts. The WSS Modernization Project involves the possibility of land acquisition and economic displacement. To minimize the risk, an appropriate RPF has been developed at the project level, while a site-specific RAP will be developed where needed. The main risk is associated with appropriate implementation of the RPF.
ESS6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	The project area is the whole entity, which includes several nationally and internationally recognized natural and critical habitats, protected areas, wetlands and Ramsar sites as well as hundreds of locally designated nature sites. The activities will be assessed for relevant risks, and the mitigation hierarchy will be applied. Development of site-specific ESMPs will be considered as part of screening and approval procedure. Environmental screening will ensure that no activities with potential negative impacts are eligible for funding in natural or critical habitats. In case of activities to be funded by the project and to be implemented in modified habitats, the project-level will present requirements to avoid or minimize the respective impacts on biodiversity and implement mitigation measures as appropriate.

ESS		Relevance to the WSSM
ESS8	Cultural Heritage	Information that are available in the project appraisal phase indicate that it is very unlikely that there will be any interaction of construction works with known cultural heritage sites. In the event of chance finds, the Borrower will deal with it taking into account national legal requirements that are fully consistent with UNESCO and good international practice.
ESS10	Stakeholder Engagement and Information Disclosure	This ESS guides the inclusion of relevant stakeholders in the project lifecycle. In line with the requirements of this ESS, a Stakeholder Engagement Plan including a Grievance Mechanism has been developed for this project. The main risk is associated with appropriate implementation of SEP.

7.2 Preliminary Identification of Potential E&S Impacts

This chapter provides preliminary E&S risk assessment of activities that will be financed under the three project components.

Component 1 is mainly focused on financing technical assistance activities and work of PIU to successfully perform management project management-related activities. It is not expected that those activities will have any impact on environment since they involve mainly office based desktop research activities and capacity building trainings. Considering the social aspect of these activities, it is possible to experience social issues related to labor aspects that are contrary to the requirements of ESS2 and ESS4. Therefore, it will be important that appropriate social instruments are implemented including the Labor Management Procedure (LMP) and the Stakeholder Engagement Plan (SEP) prepared for this Project, that reflect the principles and requirements of ESS2, ESS 4 and ESS 10. The same is valid for activities financed under **Component 2** which support technical assistance with the aim of institutional strengthening and capacity building activities at municipal level. All technical assistance and planning or design documents produced under these two components will integrate environmental and social best practices in line with the ESSs and the ESF from a design standpoint, i.e. throughout the document.

C**omponent 3** is focused on infrastructure investments for improving access, quality and efficiency of WSS service which are likely to have negative environmental and social impacts. These include but are not limited to:

Water efficiency investments
- NRW reduction (leak repair, pressure control, etc.)
- Energy efficiency measures (pipes and pumps replacement, better planning and zoning, etc.)
- Metering & commercial systems
Water assets renewal and extension, other water components
- Water system rehabilitation and extension
- WTP rehabilitation and construction
- SCADA, GIS, other measures
Wastewater assets renewal and extension
- Sewer network rehabilitation and extension
- Improvements to existing WWTPs
WWTP construction
- New WWTPs

In the pre-construction phase, only social impacts related to land acquisition and livelihood restoration may possibly occur. For this phase it is important that the principles of ESS5 set in the Resettlement Policy Framework (RPF) developed for this Project are implemented and appropriate Resettlement Action Plans (RAPs) prepared.

For all planning purposes, the protected and sensitive areas will be avoided, however, if this is not a possibility the relevant aspects of ESS6 will be integrated into the design and due diligence documentation. A similar approach is to be used for cultural heritage and provisions of ESS8. Since BiH is affected by climate change the design of project facilities should include necessary measures for the adaptation of climate change in the planning and design of water and sanitation facilities.

In the construction phase, The infrastructure investments envisioned within the project may have certain negative impacts on the environment during construction/ reconstruction and removal of materials/ old equipment (e.g. old pumps, water meters, etc.). The common environmental and social impacts are those resulting from construction works and generation of construction and demolition waste and other types of special waste categories. These may include impacts such as dust and noise, waste management, potential finds of hazardous materials such as asbestos-cement pipes, chance finds for pipe network, Occupational Health and Safety (OHS) and labor issues. If it is known that reconstruction activities will include removal of asbestos-cement pipes, it will be necessary to conduct a hazard analysis to systematically identify the system and procedures to be implemented. If the generated waste is considered hazardous, the Borrower will comply with existing national requirements for management of hazardous wastes (including storage, transportation and disposal) including national legislation and applicable international conventions, including those relating to transboundary movement. The provisions on pollution prevention and resource sustainability of ESS3 will be integrated here, and any aspects of Community Health and Safety from ESS4.

In the *operational/maintenance phase* environmental and social impacts may include procurement, use, management and disposal of chemicals for water supply treatment, odor and noise of the wastewater treatment plants, sludge management from such facilities, OHS and labor issues. One of the key concerns related to environmental sustainability is the management of sludge from wastewater treatment plants, as management of such wastes in already existing facilities is questionable and sometimes environmentally unsustainable. The Bank team will work with the Borrower to further advance management of such wastes in line with Environmental and Social Standard 3 (ESS3).

A brief summary of the potential negative impacts, together with the proposed mitigation measures, is given in *Table 15*.

Table 15: Preliminary identification of environmental and social impacts of proposed subprojects

NAME OF THE COMPONENT/ SUB-COMPONENT	DESCRIPTION OF ACTIVITIES	PRELIMINARY E&S IMPACT ASSESSMENT
COMPONENT 1: IMPROVING THE ENABLING ENVIRONMENT FOR SECTOR MODERNIZATION		
Sub-component 1.1: Support for water supply and sewerage sector reforms on Entity level	Technical assistance activities: - development of a WSS sector financing mechanism - institutionalization of a utility benchmarking system - development of a rural WSS data base; - national capacity building program for the professionalization of the sector	No environmental impacts. Social impacts in the operational phase are mainly related to possible labor issues, occupational health and safety, setting up grievance mechanism and necessity to engage stakeholders in all project activities.
Sub-component 1.2: Project management and coordination of the sector reforms	Financing of PIU to perform project management-related activities: - audits, training, safeguards and fiduciary management, and all associated Project operating costs - managing beneficiary satisfaction surveys and feedback mechanism, including a grievance redress mechanism, - financial and technical support to line ministries and established Entity Working Groups - technical advice for the formulation of regulatory and policy frameworks, policy facilitation and public consultations	No environmental impacts. Social impacts in the operational phase are mainly related to possible labor issues, occupational health and safety, setting up grievance mechanism and necessity to engage stakeholders in all project activities.
COMPONENT 2: SUPPORT FOR WATER SERVICES SECTOR REFORMS ON MUNICIPAL LEVEL	Technical assistance activities: - The preparation of water utility business plans (BP) - Development and signing of Public Service Agreements (PSAs) between the municipality and the water utilities - Preparation of tariff proposal, based on legislation set on Entity level - Support for organizational restructuring - Capacity building on technical, commercial and financial topics	No environmental impacts. Environmental practices shall be integrated into the documents as needed. Social impacts in the operational phase are mainly related to possible labor issues, occupational health and safety and necessity to engage stakeholders in all project activities.

NAME OF THE COMPONENT/ SUB-COMPONENT	DESCRIPTION OF ACTIVITIES	PRELIMINARY E&S IMPACT ASSESSMENT
COMPONENT 3: IMPROVING ACCESS, QUALITY AND EFFICIENCY OF WSS SERVICE DELIVERY	Infrastructure investments for improving access, quality and efficiency of WSS service delivery including, but not limited to: - Water efficiency investments including NRW reduction (such as leak repair, pressure control, etc.), energy efficiency measures and metering & commercial systems - Water assets renewal and extension, other water components including water system rehabilitation and extension, Water Treatment Plant (WTP) rehabilitation and construction, SCADA, GIS, other measures - Wastewater assets renewal and extension including sewer network rehabilitation and extension, improvements to existing Waste Water Treatment Plants (WWTPs) - New WWTPs construction	**Impacts:** *In the pre-construction phase:* acquisition of land at the locations of the works. *In the construction phase:* a) environmental impacts: construction specific impacts relates to emissions of dust and noise, waste management including management of old equipment (pumps, water meters, etc.) and other special waste categories, potential finds/removals of hazardous materials such as asbestos-cement pipes, chance finds for pipe networks, etc. b) social impacts: OHS and labor issues relevant to construction workers; community health and safety during construction; minor negative impacts could be expected through human presence and nature of construction works at site, which are limited to the location of works or its surrounding vicinity; public exclusion from project activities; large influx of workers from outside communities is not expected. *In the operational/maintenance phase:* a) the expected impacts are mainly related to maintenance of network structures and have a similar effect on the environment as the construction works involve the presence of workers and machinery on the site. In addition, procurement, use, management and disposal of chemicals for water supply treatment, odor and noise of the wastewater treatment plants and sludge management from such facilities are identified as major environmental impacts. b) OHS and labor issues and community health and safety as a consequence of inadequate waste management (chemicals, sludge).

7.3 Environmental and Social Requirements for the Project

Since the WSS Modernization Project involves a set of subprojects to be identified, prepared and implemented during the project, pursuant to the WB E&S requirements described in ESS 1 – Assessment and Management of E&S Risks and Impacts, the PIU will assess the E&S impacts of each sub-component and related subprojects using this ESMF.

For each individual sub-project, the PIUs will prepare an ESIA or ESMP using guidance provided in this ESMF. The selection of the E&S instrument will be based on the screening process and the determined subproject E&S risk.

Table 16 provides a review of the activities that will be implemented in the framework of the three components versus the WB and the national E&S requirements that need to be fulfilled in the process of project approval. The entity requirements stem from the legal requirements in the field of environmental protection, water management and physical planning and construction, previously described in detail in *Chapter 5.2 Overview of Environmental and Social Requirements.*

In case of prolonged pandemic caused by coronavirus, the capacity building activities within Component 1 and 2 will be organized in line with Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings (March 20, 2020).

In case the Borrower proposes other types of activities which are not mentioned in the table below, the decision to finance such activities will be made through a dialogue with the Bank and based on project categorization and adequate due diligence.

In case of development of any strategic or other referent documents the Borrower will include any social and environmental risk management aspects in an integrated manner as part of the design.

For activities and purchases that are submitted as retroactive financing (i.e. will seek funds from the project after commencement or completion of such activities) the PIU specialists will need to conduct a screening in line with this ESMF and develop due diligence, as if the activity is going to be financed. Once the due diligence is prepared, the specialist will make an assessment of the present status on the ground compared to the due diligence, indicate any non-compliance and gaps, and present an action plan how to address those gaps in a given time period.

Table 16: Environmental and social requirements for the Project

Type of activities	WB requirements			National requirements		
	Risk category pursuant to WB	Environmental assessment instrument	Social instrument	Environmental protection	Water management	Physical planning and construction
COMPONENT 1: IMPROVING THE ENABLING ENVIRONMENT FOR SECTOR MODERNIZATION / COMPONENT 2: SUPPORT FOR WATER SERVICES SECTOR REFORMS ON MUNICIPAL LEVEL						
Technical assistance activities	No risk	-	LMP, SEP	-	-	-
COMPONENT 3: IMPROVING ACCESS, QUALITY AND EFFICIENCY OF WSS SERVICE DELIVERY						
Water efficiency investments including NRW reduction (such as leak repair, pressure control, etc.), energy efficiency measures and metering & commercial systems	To determine the risk carry out the sub-project screening in line with the procedure in Chapter 7.4.	"High" risk projects are not eligible for financing. For "substantial" risk subprojects, ESIA with a site-specific ESMP will be prepared in line with this ESMF. For "moderate" risk subprojects, a site-specific ESMP will be prepared in line with this ESMF. For "low" risk subprojects, a generic ESMP will be prepared in line with this ESMF.	LMP, SEP	-	-	-
Water assets renewal and extension, other water components including water system rehabilitation and extension, WTP rehabilitation and construction, SCADA, GIS, other measures			RPF/RAP, SEP, LMP	In case that the activity involves abstraction of water in volume equivalent to or exceeding 3 million cubic meters Environmental Impact Assessment procedure carried out by the ministry of environment and ultimately ending with issuing of environmental permit. Submit the EIA Study including Waste Management Plan. In case that the activity involves abstraction of water in volume of between 1 - 3 million cubic meters Preliminary impact assessment based on which the ministry of environment decides on the necessity to conduct a full EIA and ultimately issues the environmental permit In case that the activity involves	Water Management Acts except in case of expansion or reconstruction of the water system that is in use, i.e. for which the water permit is issued in accordance with the Law, if this expansion does not involve the capture of new amounts of water	Construction related permits

Type of activities	WB requirements			National requirements		
	Risk category pursuant to WB	Environmental assessment instrument	Social instrument	Environmental protection	Water management	Physical planning and construction
				abstraction of water in volume of less than 1 million cubic meters Check Cantonal regulations to determine if environmental permitting is needed. If yes, submit the request for environmental permit including Waste Management Plan. In case the expansion of WTP is greater than 25% seek the opinion of the ministry of environment on the necessary of environmental impact assessment procedure.		
Wastewater assets renewal and extension including sewer network rehabilitation and extension, improvements to existing WWTPs			RPF/RAP, SEP, LMP	In case the expansion of WWTP is greater than 25% seek the opinion of the ministry of environment on the necessary environmental assessment procedure.	Water Management Acts except for expansion or reconstruction of the sewage system for which the water permit was issued in accordance with the Water Law for transporting of wastewater from the corresponding collection area to the existing WWTP	Construction related permits
New WWTPs construction			RPF/RAP, SEP, LMP	> 50.000 Population Equivalent (PE) Environmental Impact Assessment procedure carried out by the ministry of environment and ultimately ending with issuing of environmental permit. Submit the EIA Study including Waste Management Plan. 10.000-50.000 PE Preliminary impact assessment based	Water Management Acts	Construction related permits

Type of activities	WB requirements			National requirements		
	Risk category pursuant to WB	Environmental assessment instrument	Social instrument	Environmental protection	Water management	Physical planning and construction
				on which the ministry of environment decides on the necessity to conduct a full EIA and ultimately issues the environmental permit <10.000 PE Environmental permitting at cantonal level. Submit the request for environmental permit including Waste Management Plan.		

7.4 Environmental and Social Screening Process (Step-by-Step)

This chapter describes the methodology to be followed by the PIU in identifying an managing environmental and social risks of each sub-project implemented under Component 3 of the Project. The review of the process is given in the following scheme.

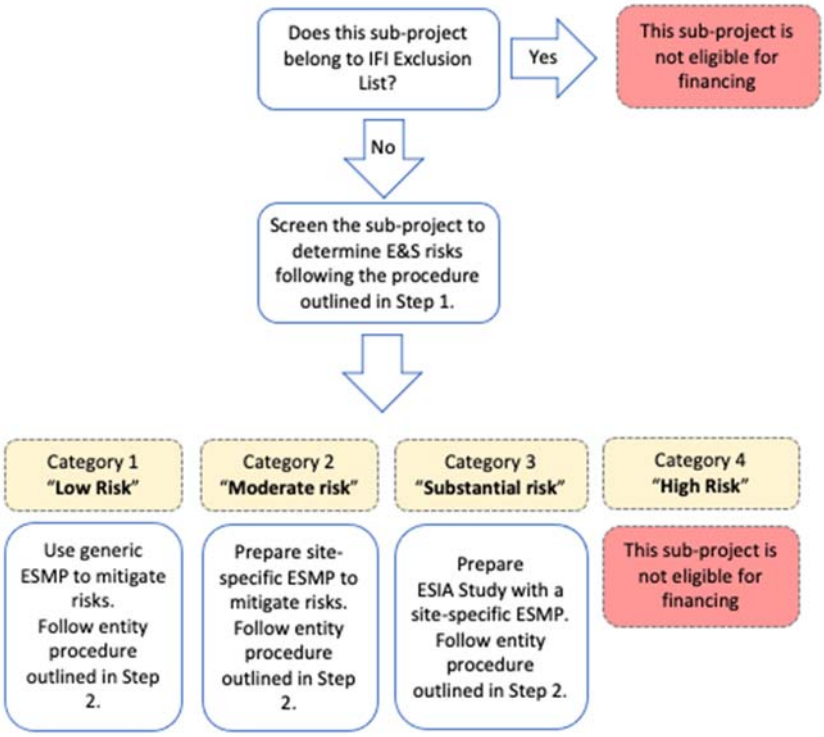


Figure 18: Schematic overview of the risk assessment process

Step 1. Carry out the rapid risk analysis and E&S assessment pursuant to the WB requirements

Rapid risk assessment of each sub-project will be done based on the rapid assessment of project impacts and sensitivity of receiving environment. The steps to follow are described below.

1. Assessment of project impact based on:

- **Magnitude of the project** : depending on the project technical characteristics such as length of the pipeline, capacity of treatment plant, etc.
- **Scope of works**:

  New construction - when the proposed project constitutes a new investment, usually in new areas where, in most cases, land and/or households will be affected. The extension of pipeline/plant is also considered as a new project.

  Rehabilitation - When the existing structure requires specific work in order to recover its original characteristics, however, an increase in original design is not expected. No affectation of land or households.

  Maintenance - periodic works that the WSS or SS requires in order maintaining the project in optimal conditions.

Rapid assessment of impacts of water supply sub-project will be done using the following matrix:

Component	*Magnitude*	*Scope*	*Impact*
Water intake	[ ] Volume equivalent to or exceeding 3 million cubic meters	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Medium [ ] Medium [ ] Low
	[ ] Volume of between 1 - 3 million cubic meters	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Medium [ ] Low [ ] Low
	[ ] Volume of less than 1 million cubic meters	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Medium [ ] Low [ ] Minor or no impact
Water treatment plant	[ ] Volume equivalent to or exceeding 3 million cubic meters	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] High [ ] Medium [ ] Low
	[ ] Volume of between 1 - 3 million cubic meters	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Medium [ ] Low [ ] Low
	[ ] Volume of less than 1 million cubic meters	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Medium [ ] Low [ ] Low
Pipeline/ distribution network (including rehabilitation as a part of NRW or EE measures)	[ ] Length more than 10 km	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Moderate [ ] Low
	[ ] Length between 1 and 10 km	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Low [ ] Minor or no impact
	[ ] Length less than 1 km	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Low [ ] Low [ ] Minor or no impact
Storage tank/Reservoir	[ ] Volume more than 5000m^3	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Moderate [ ] Low
	[ ] Volume between 500-5000m^3	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Low [ ] Minor or no impact
	[ ] Volume less than 500m^3	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Minor or no impact [ ] Minor or no impact
Pumping station	[ ] Capacity more than 100 kWh	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Moderate [ ] Low
	[ ] Capacity between 10-100 kWh	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Low [ ] Minor or no impact
	[ ] Capacity less than 10 kWh	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Low [ ] Minor or no impact [ ] Minor or no impact
Metering		[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Low [ ] Low [ ] Minor or no impact

Component	*Magnitude*	*Scope*	*Impact*
Other water components (SCADA, GIS, other soft measures)	-	-	[ ] No impact

Rapid assessment of impacts of wastewater sub-project will be done using the following matrix:

Component	*Magnitude*	*Scope*	*Impact*
Sewage network	[ ] Length more than 10 km	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Moderate [ ] Low
	[ ] Length between 1 and 10 km	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Low [ ] Minor or no impact
	[ ] Length less than 1 km	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Low [ ] Low [ ] Minor or no impact
Pumping station	[ ] Capacity more than 100 kWh	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Moderate [ ] Low
	[ ] Capacity between 10-100 kWh	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Moderate [ ] Low [ ] Minor or no impact
	[ ] Capacity less than 10 kWh	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Low [ ] Minor or no impact [ ] Minor or no impact
Waste water treatment plant	[ ] Capacity more than 50.000 PE	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] High [ ] Medium [ ] Low
	[ ] Capacity between 10.000 and 50.000 PE	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Medium [ ] Low [ ] Low
	[ ] Capacity less than 10.000 PE	[ ] New construction [ ] Rehabilitation [ ] Maintenance	[ ] Medium [ ] Low [ ] Low

2. Assessment of sensitivity of receiving environment:

- High sensitivity: Areas with important ecological and sociocultural characteristics in the direct influence area. Commonly inside national parks or protected areas. High degree of biodiversity, endemism, and threat. Great danger of environmental degradation (deforestation, hunt), critical ecosystem (wetlands, forests, etc.), areas with a high index of natural disasters (floods, earthquake, etc.), and places of significant cultural and historical interest.
- Moderate sensitivity: Areas with important ecological and sociocultural characteristic in the indirect influence area. Commonly in "buffer" zones. Moderate decree of biodiversity, endemism, and threat, Moderate danger of environmental degradation (deforestation, hunt), critical ecosystem (wetlands, forests, etc.), areas with high index of natural disasters (floods, earthquake, etc.), and places of significant cultural and historical interest.
- Low sensitivity: Area previously affected or with no critical ecosystem and social aspects in the direct or indirect influence area. Low degree of biodiversity, endemism and threat; low danger of environmental degradation (deforestation, hunt, etc.); low risk to natural disasters (floods, earthquake); and no presence of cultural/historical sites in the direct or indirect influence area.

Sensitivity	*Description*
HIGH	[ ] Protected areas in the direct influence area [ ] High danger of environment degradation (deforestation, hunting, others) [ ] Sensitive or critical ecosystem in the direct influence area (wetlands, peatlands, primary or secondary forests, and others) [ ] Mountainous topography (>35% of slope) when the project anticipates construction of access road, pipelines, etc. [ ] Vulnerable areas to natural disasters (floods, earthquake, and others) [ ] Presence of places of significant cultural and historical interest in the direct influence area
MODERATE	[ ] Protected Areas in the indirect influence area or in buffer zones [ ] Moderate danger of environment degradation (deforestation, hunting, others) [ ] Sensitive or critical ecosystems in the indirect influence area (wetlands, peatlands, primary or secondary forests, and others) [ ] Wavy topography (15-35% of slope) where the construction of access road, pipelines, etc. is expected [ ] Moderate risk to natural disasters (floods, earthquake, and others) [ ] Presence of places of cultural and historical significance in the indirect influence area
LOW	[ ] Intervened areas out of protected areas (national parks, or buffer areas) [ ] Low danger of environmental degradation (deforestation, hunt, and so forth) [ ] Sensitive or critical ecosystem areas not in the direct influence area (wetlands, peatlands, primary or secondary forests, and others) [ ] Flat topography (<15% of slope), when the project expects the construction of access road, pipelines, etc. [ ] Zones at low risk to natural disasters (floods, earthquake, and others) [ ] Absence of places with cultural and historical significance

If at least one setting triggers the high variables, the evaluator can conclude that the project or component has a **HIGH** site sensitivity; if there is no setting in high, but at least one setting is triggered in the moderate variables, the evaluator can conclude that the project or component has a **MODERATE** site sensitivity; and if there are no triggers in the high or moderate settings, the evaluator can conclude that the project or component has a **LOW** site sensitivity.

3. Determine the category of risk

The following matrix will be used to determine the category of risk:

Project impact	Sensitivity of receiving environment		
	High	Moderate	Low
High	High	Substantial	Moderate
Moderate	Substantial	Moderate	Moderate
Low	Moderate	Moderate	Low
Minor or no impact	Moderate	Low	Low

Description of risk categories:

HIGH risk level: Project is likely to have a significant adverse impact on the environment

SUBSTANTIAL risk level: Project is likely to have a significant adverse impact on the environment, but the magnitude of that impact is not well known.

MODERATE risk level: Project is likely to have a significant adverse impact on the environment, and the magnitude of that impact is known

LOW risk level: Project is likely to have no significant adverse environmental and social negative impacts

If a project has more than one component, this process should be applied for each component. The final result of the environmental risk level for the project will be the higher classification obtained in each component. For example, if the project includes the construction of a new pipeline and the rehabilitation of a reservoir, and the first component was classified as ”low risk” and the second component was classified as “moderate risk”, the entire projects should be classified as “moderate risk”.

According to the rapid risk assessment the following actions will be taken:

Risk category	*Action to be taken*	*Result of the action*
High risk subprojects	High risk activities are not eligible for financing	Reconsider changing the design or siting characteristics and resubmit the sub-project.
Substantial risk subprojects	A preliminary environmental assessment is required to decide whether the project can proceed without a full environmental impact assessment. An assessment will be carried out in line with the entity laws, this ESMF and provisions set forth under ESS1 and the ESF.	WB requirements on E&S impacts mitigation and monitoring included in the tender dossier/bidding documents. Mitigation obligations assigned to the hired contractor. Monitoring assigned to contractor or supervisor, as relevant.
Moderate risk subprojects	A site-specific ESMP will be produced in line with this ESMF. Sections related to all applicable ESSs shall be included.	WB requirements on E&S impacts mitigation and monitoring included in the tender dossier/bidding documents.

Risk category	*Action to be taken*	*Result of the action*
		Mitigation obligations assigned to the hired contractor. Monitoring assigned to contractor or supervisor, as relevant.
Low risk subprojects	The implementation can start after inclusion of generic ESMP into construction works contract. A generic ESMP has been prepared for the purpose of this project and is provided in Annex C to this ESMF.	WB requirements on E&S impacts mitigation and monitoring included in the tender dossier/bidding documents. Mitigation obligations assigned to the hired contractor. Monitoring assigned to contractor or supervisor, as relevant.

Additionally, the PIU will be responsible to:

- in case of any land acquisition issues identified, prepare a site-specific Resettlement Plan in line with the guidance given in the Resettlement Framework developed for the WSS Modernization project,
- implement the developed Labor Management Procedure, and update it as necessary,
- undertake stakeholder engagement and disclose appropriate information in accordance with the Stakeholder Engagement Plan developed for the WSS Modernization project,
- integrate recommendations and guidance of all ESSs as relevant,
- conduct monitoring and reporting on the E&S performance of the for the WSS Modernization project against the program-specific ESMF, RPF, SEP and LMP.

More details on institutional roles and responsibilities are given in Chapter 8.

Step 2. Carry out an environmental assessment in line with entity regulations

For the activities listed in the table below, carry out an environmental assessment depending on the subproject location, as explained in Chapter 5.2.1 Environmental Assessment Procedure.

If the assessment indicates that a subproject is high risk and requires the development of an ESIA according to WB standards (Step 1), this project is not eligible for financing.

For subprojects for which the Bank requires the development of a site-specific ESMP, the ESMP requirements shall be integrated in the environmental documentation submitted to responsible authorities.

Type of activities	Action to be taken	Result of the action
WTPs / Water intakes	In case that the activity involves abstraction of water in volume equivalent to or exceeding 3 million cubic meters Environmental Impact Assessment procedure carried out by the ministry of environment and ultimately ending with issuing of environmental permit. Submit the EIA study including Waste Management Plan. In case that the activity involves abstraction of water in volume of between 1 - 3 million cubic meters Preliminary impact assessment based on which the ministry of environment decides on the necessity to conduct a full EIA and ultimately issues the environmental permit In case that the activity involves abstraction of water in	Environmental permit

Type of activities	Action to be taken	Result of the action
	volume of less than 1 million cubic meters Check Cantonal regulations to determine if environmental permitting is needed. If yes, submit the request for environmental permit including Waste Management Plan. *Note: In case the expansion of WTP is greater than 25% seek the opinion of the ministry of environment on the necessary of environmental impact assessment procedure.*	
WWTPs	Capacity > 50.000 Population Equivalent (PE) Environmental Impact Assessment procedure carried out by the ministry of environment. Submit the EIA study including Waste Management Plan. Capacity 10.000-50.000 PE Preliminary impact assessment based on which the ministry of environment decides on the necessity to conduct a full EIA and ultimately issues the environmental permit Capacity <10.000 PE Environmental permitting at cantonal level. Submit the request for environmental permit including Waste Management Plan. *Note: In case the expansion of WWTP is greater than 25% seek the opinion of the entity ministry of environment on the necessary environmental assessment procedure.*	Environmental permit
Pipelines/pump stations/reservoirs	No action needed	-
Other water components (metering, SCADA, GIS, other soft measures)	No action needed	-

Step 3. Organize consultations with stakeholders

Stakeholder consultations shall be organized at the location closest to the project implementation site in line with the requirements of the SEP developed for the WSS Modernization Project. If the subprojects require the development of a nationally required and regulated EIA, such process also includes public involvement, public hearings and a publicly disclosed study in the manner prescribed by the entity legislation (comments on public document recorded and responses provided by the institution/organization responsible for preparing the EIA). Ensure such public consultations are also in line with the requirements of WB and the Stakeholder Engagement Plan prepared for the WSS Modernization Project. For certain activities, a decision on the necessity to undertake an EIA procedure shall be requested by the relevant entity authority.

In case of prolonged pandemic caused by coronavirus, the stakeholder engagement will be organized in line with Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings (March 20, 2020).

Step 4. (*If needed and where applicable*) Obtain various permits and approvals

- *Water Management Acts* in line with the requirements of the Water Law as described in Chapter 5.2.3,
- *Construction related acts* in line with the requirements of the construction regulations as described in Chapter 5.2.4.

Step 5. Implementation of mitigation measures/plans

The ESMP shall be integrated in the tender documents and later on in a legal agreement between the Ministry and a Contractor. The contractor shall integrate all mitigation measures from the ESMP and received environmental and water permits in Construction Environmental Management Plan expanded with social aspects to include social mitigation measures.

Step 6. Supervision and reporting

The PIU in cooperation with PITs will review the status of mitigation/ESMPs implementation through direct supervision as well as through contracted supervision engineering authority (see Chapter 5.2.4 Construction Regulations for more details) and regularly report to the bank as described in Chapter 8.2 Reporting.

7.5 Labor Management

Pursuant to WB requirements, a Labor Management Procedure has been developed as a separate document. The procedure aims to ensure fair treatment of workers and provision of safe and healthy working conditions.

Contractors' labor management compliance with local legislation requirements related to labor and safety at work would be monitored based as described in Chapter 8.2 Reporting. In case any irregularities are identified based on such reports or the project grievance redress mechanism, PIUs would notify the responsible Labor Inspection.

8 ESMF IMPLEMENTATION ARRANGEMENTS

8.1 Institutional responsibilities

The overall responsibility for ensuring compliance with environmental and social safeguards requirements as set out in the ESMF rests with the FBiH Ministry of Agriculture, Water Management and Forestry. The PIU will be established within the Ministry and will act as project coordinator and project focal point. The PIU will be supported by local Project Implementation Teams (PITs).

The **PIU in cooperation with PITs** shall monitor the implementation of this Framework, both at overall Project level and individual subproject level. The PIU will be staffed with an environmental and social specialist as the basic requirement for implementation of the project in line with the World Bank's ESF, relevant ESS and this ESMF. The responsibilities of the PIU environmental specialist are to:

- Ensure E&S due diligence is carried out for each sub-project as soon as technical design and scope have been defined, as outlined in this ESMF
- Review E&S assessment documents and liaise with the World Bank for clearance
- Manage the consultants hired to undertake E&S assessments, where applicable, and provide coordination support with implementation partners
- Undertake technical review of Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs) by Consultants and Contractors.
- Ensure adequate public consultation during the preparation of E&S instruments as defined by the SEP and Project implementation Manual
- Ensure that the requirements of the site-specific ESMPs and environmental and water permits are included in employer's requirements for the construction works
- Hold regular review meetings with PITs, consultants, contractors, implementing partners and carry out regular site visits to monitor implementation of the E&S instruments
- Provide guidance on implementation of project mitigation measures as per approved E&S documents (ESIA/ESMP)
- In cooperation with PITs, undertake environmental monitoring and supervision of project works, including development of periodic progress reports, to ensure compliance with relevant environmental requirements
- Develop training plans, alone or in cooperation with hired consultants, and deliver/supervise implementation of training on environment issues during implementation of the project and associated works to the project implementing staff, Contractors and other relevant project stakeholders.

The responsibilities of the PIU social specialists are:

- Ensure social due diligence is carried out for each sub-project as soon as technical design and scope have been defined, as outlined in the ESMF, RPF, LMP and SEP
- Review E&S assessment documents (ESIA/ESMP, RAP) and liaise with the World Bank for clearance
- Manage the consultants hired to undertake E&S assessments, where applicable, and provide coordination support with implementation partners;
- Manage the consultants hired to develop resettlement action plans and planning documents and provide coordination support with implementation partners;
- Supervise and review land acquisition and involuntary resettlement activities in projects under implementation and provide periodical updates;
- Provide intensive on-site field level support to consultants and/ or client agencies involved in preliminary resettlement studies or preparation of resettlement action plans;

- Establish and operationalize the project Grievance Redress Mechanism(s) (GRMs) in the PIU as defined in the SEP and the LMP developed for this project;
- Provide support to PITs, Consulting Companies and Contractors to establish and operationalize the project Grievance Redress Mechanism(s) as defined in the SEP and the LMP developed for this project;
- In cooperation with PITs, undertake social monitoring and supervision of project works, including development of periodic progress reports, to ensure compliance with relevant social requirements.
- Undertake capacity development of PIT, Consulting Companies/Individual Consultants, and Contractors during project implementation with respect to planning and implementation of social instruments (RPF/RAP, LMP, SEP), including conduct of project awareness, communication and sensitization activities.
- Act as a link between PITs, Consulting Companies/Individual Consultants, Contractors, Communities and respective local governments on social matters.

The responsibilities of PITs' staff is to:

- facilitate the work of consultants conducting environmental and social assessments
- identify stakeholders; hold consultations with different groups of stakeholders especially local communities, including vulnerable groups especially women, and local government officials on impacts of proposed interventions
- establish (at the outset of a sub-project) a GRM and ensuring its effective functioning
- ensure systematic consultation with communities and other local level stakeholders throughout the life cycle of the project
- supervision and monitoring of implementation of mitigation measures in ESMPs
- providing monthly reports on E&S matters to PIU.

The PIU environmental and social specialists will also assess the workloads at any given time with heads of the PIU, and anticipate them for the future in order to seek additional help, as needed. Adequate planning of outsourced preparation of due diligence required will also be essential to the project implementation time-line. Furthermore, the specialists will work together with the World Bank E&S specialists to ensure they receive the needed ESF training, obtain guidance, and help organize trainings for the municipal project participants.

Preparation of technical assistance documents and site-specific ESIA/ESMPs for priority investments will be undertaken by qualified **Consulting Companies/Individual Consultants**. The Consulting Companies/Individual Consultants will be selected by the PIU following the national tender procedure. The proof of qualification are the references/experience in similar projects carried out for international financial institutions with at least 7 years of track record/working experience in the field. The indicative outlines of ESIA and ESMPs to be included in the Terms of Reference (ToR) are given in Annexes D and E. All relevant TORs are subject to clearance from the World Bank team, and shall include as a minimum: the description of the project to be financed, the list of available documentation and designs (and due diligence documentation prepared for the Project), including those that are under preparation, a reference of all the relevant environmental, OHS and other laws in country (entity), along with a list of the relevant World Bank environmental and social standards. The TORs shall define the content of the due diligence documentation and the package of the documentation specific to each project site and list the deliverables. The TORs shall specify that no deliverable will be completed without public consultations and finalization of the documents. If the documents are also to be used for obtaining environmental permits from the relevant authorities, the works envisaged under the TOR shall terminate only upon obtaining such permit.

It is the responsibility of the **Contractor** to ensure the proper execution of works, according to prescribed measures and in line with entity and international standards. Therefore, the Contractor shall appoint a person responsible for environmental and social protection (B.Sc. environmental engineering or similar) with adequate experience to be responsible for the implementation of all environmental and social protection requirements and ESMP implementation. The appointed person shall ensure compliance with the Banks' environmental and

social standards and is responsible for environmental and social protection according to the ESMP and obtained permits, in line with clearly defined tasks and responsibilities, which include, among others: works are executed in line with good construction practices, waste is adequately managed at the construction site including asbestos-containing waste, OHS measures are implemented at construction site, environmental and social protection issues are communicated with the supervising body and the local community. The works are supervised by the nominated supervising body, which controls that the activities are taken in line with the environmental management plan. Contractors' labor management compliance with local legislation requirements related to labor and safety at work would be monitored based on the basis of Reports on Compliance of Conditions of Work with ESS 2, which the contractors shall submit to the PIUs and supervising body on a regular basis. The format of the report is provided in LMP's Annex.

8.2 Reporting

The PIU shall establish and maintain records on:

- screening of sub-projects
- engagement of Consulting Companies/Individual Consultants
- developed E&S instruments and their implementation
- progress of activities and works that require E&S supervision
- information on engagement of all stakeholders in line with SEP
- records of grievances in accordance with the SEP and LMP

The PITs shall establish and maintain records on:

- progress of activities and works that require E&S supervision
- information on engagement of all stakeholders in line with SEP
- records of grievances in accordance with the SEP and LMP

PIT staff will submit project specific monthly environmental and social progress reports to the PIU who will discuss any issues noted in these reports with private sector counterparts. The PIU will prepare and submit quarterly progress reports to WB on subproject screening, approval and monitoring results.

8.3 Key elements of a budget for ESMF compliance

The total cost for ESMF implementation cannot be estimated as the number of technical assistance activities or sub-projects is unknown. Key elements of the ESMF requiring a cost budget are highlighted and indicative unit costs are shown. These need to be reviewed and revised as necessary.

The costs of implementing site specific ESIAs/ESMPs, RAPs and SEPs shall be included in relevant sub-project budgets. Establishment of GRMs as per the SEP and the LMP and implementation of stakeholder engagement activities does not entail any additional costs.

Type of activities	Description	Unit cost US$
Technical assistance	Development of different technical studies (such as business plans, Public Service Agreements, tariff proposal etc.) and capacity building on technical, commercial and financial topics	The total cost will be calculated based on the number of days required to complete a study and all-inclusive consultant daily fee: ▪ Local up to 350 USD ▪ International up to 700 USD
Development of site-specific ESIA	Recruitment of Consultants to prepare studies	up to 50,000 USD

Development of site-specific ESMP	Recruitment of Consultants to prepare studies	up to 35,000 USD
Development of site-specific RAP	Recruitment of Consultants to prepare studies	up to 35,000 USD
Development of site-specific SEP	Recruitment of Consultants to prepare studies	up to 20,000 USD

9 PUBLIC CONSULTATIONS PROCESS

TBA

ANNEXES

A	Sites of Cultural and Historical Heritage in Municipalities of the FBiH
B	Overview of Cantonal Ministries Responsible for Water Management and Environmental Issues
C	Generic Environmental and Social Management Plan for the Project
D	Indicative outline of ESIA
E	Indicative outline of site-specific ESMP
F	Minutes from the public consultations

A. Sites of Cultural and Historical Heritage in the Preselected Municipalities in the FBiH

City/Municipality	Site
Tesanj	Old town of Tesanj, the architectural ensemble
	Necropolis of tombstones Vukovo, the historic site
	Eminagica konak, the historic building
	Gazi Ferhad-beg mosque or Carsija mosque (Ferhadija) with harem, turbe and well, the site and remains of the architectural ensemble
	Sahat kula (Clock tower), the historic monument
Citluk	The Church of St. Stephen in Cerin, the architectural ensemble
	The Church of St. Blaz in Gradinici, the architectural ensemble
	Parish church of St. James in Medugorje, the architectural ensemble
	Mainovac cemetery and Bedra area as a presumed archaeological site in Vionica, the historical site
	Hajduk Tower-house in Krucevica Brdo, the historic building
	Hill Krizevac in Medugorje, *the historic site*
Gracanica	Sahat kula (Clock tower), the historic monument
	Old town of Soko, the architectural ensemble
	Korica Han, the archaeological site
	Mara Popovic house, the historic building
	Donja mosque in the village of Lukavica, the historic building
	Konak – Town hall, the historic building
	Lipanjska mosque with harem, the architectural ensemble
	The Orthodox church in Petrovo, the historic monument
	The monastery of St. Nikola in Petrovo, the architectural ensemble and historic monument
Siroki Brijeg	The Franciscan monastery with church, the architectural ensemble
	Parish church of St. Petar and Paul in Kocerin, the architectural ensemble
	The Church of St. Ante in Ljuti Dolac, the architectural ensemble
	Necropolis of tombstones in Mokro, the historic site

B. Overview of Cantonal Ministries Responsible for Water Management and Environmental Issues

Canton	Ministry responsible for water management	Ministry responsible for environment protection
Sarajevo Canton	Ministry of Economy	Ministry of Spatial Panning, Construction and Environmental Protection
Tuzla Canton	Ministry of Agriculture, Forestry and Water Management	Ministry of Spatial Panning and Environmental Protection
Zenica-Doboj Canton	Ministry of Agriculture, Forestry and Water Management	Ministry of Spatial Panning, Transport and Communications, and Environmental Protection
Herzegovina-Neretva Canton	Ministry of Agriculture, Forestry and Water Management	Ministry of Construction and Spatial Planning
West Herzegovina Canton	Ministry of Economy	Ministry of Spatial Panning, Construction and Environmental Protection
Canton 10	Ministry of Agriculture, Forestry and Water Management	Ministry of Construction, Reconstruction, Spatial Planning and Environmental Protection
Una-Sana Canton	Ministry of Agriculture, Forestry and Water Management	Ministry of Construction, Spatial Panning and Environmental Protection
Posavina Canton	Ministry of Agriculture, Water Management and Forestry	Ministry of Transport, Communications, Tourism and Environmental Protection
Bosnia - Podrinje Canton	Ministry of Economy	Ministry of Urbanism, Spatial Panning and Environmental Protection
Central Bosnia Canton	Ministry of Agriculture, Water Management and Forestry	Ministry of Spatial Planning, Construction, Environmental Protection, Return and Housing Affairs

C. Generic Environmental and Social Management Plan for the Project

Project Phase / Activities	Possible Environmental Impacts	Mitigating Measures	Monitoring parameters	Responsible Body
Construction phase				
Mobilization/ Temporary facilities/ Construction/ De-mobilization	**General Site Conditions and Safety Notifications**			
	• Notification of public and Overall Site Safety	• The local construction and environment inspectorates and communities have been notified of upcoming activities • The public has been notified of the works through appropriate. • Notification in the media and/or at publicly accessible sites (including the site of the works) • All legally required permits have been acquired for construction and/or rehabilitation • The Contractor formally agrees that all work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment • Fencing the construction site • Control unauthorized persons' access to the site • Workers' personnel protective equipment (PPE) will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots) • Appropriate signposting of the sites will inform workers of key rules and regulations to follow and emergency contact numbers • Provide on-site medical services and supplies for any emergency, through institutional and administrative arrangements with the local health unit • Provide portable water & sanitary facilities for construction workers	• Keep written proof of notifications, local permits, and/or media announcement, clippings • Supervisor to ensure use of PPE • Supervisor to visually inspect adequate signage	• Site supervisor • PIU • Contractor for execution of civil works
Mobilization/ Temporary facilities/ Construction/De-mobilization	**Material supply**			
	• Indirect impact on environment by purchasing material for unlicensed companies	• Sourcing of materials from authorized and licensed sites	• Insight in contracts with suppliers	• Site supervisor • PIU • Contractor for execution of civil works
	• Use of borrow pits for materials	• Borrow pits shall be subject to complete restauration works following closure	• Inspection of borrow pits following closure	• Site supervisor

Project Phase / Activities	Possible Environmental Impacts	Mitigating Measures	Monitoring parameters	Responsible Body
				• PIU
Mobilization/ Temporary facilities/ Construction/De-mobilization	**Traffic and Pedestrian Safety**			
	• **Increased traffic** due to heavy equipment/vehicle movement/works in vicinity of main/local roads • **Decreased public access** through the construction area	• Schedule vehicle movement during lean daytime traffic hours or at night • Provide traffic aides/flagmen, traffic signs to help ensure the free and safe flow of traffic • Maintain & Repair temporary alternative route of vehicles & pedestrians • Supervision and management of the number of construction machines and operation time • Provide adequate lighting on the site • Provide adequate lighting in the places where passers-by or entry by public is likely • Designate an alternate route for pedestrian and/or vehicles in coordination with the Municipal Authorities or provide safe passageway through the construction site • Provision of timely information to citizens through the media about upcoming works and alternative routes	• Presence of traffic signs • Public complaints received • Occurrence of traffic jams • Number and type of construction machines • Public complaints received	• Contractor • PIU
	Air Quality – dust and noise suppression			
	• **Gas & particulate** emissions from vehicles, equipment & generators	• Regular equipment maintenance • The equipment and machinery need to be shut down when not in use • High quality fossil fuels (with low percentage of sulfur and lead) need to be used as motor fuel for machinery and equipment • Carry out construction by stages • Contractor to present proof of compliance with emission standards as part of the annual vehicle registration process	• Presence of black smoke from construction vehicles • Attestation documentation • Daily site inspection	• Contractor • Site supervisor
	• **Dust suspension** vehicle movement in unpaved roads & construction works	• Wet areas of dust sources to minimize discomfort to nearby residents • Control of vehicle speed to lessen suspension of road dust • Use of covered trucks while hauling powder construction materials	• Public complaints received • General observation • Daily site inspection	• Contractor • Site supervisor

Project Phase / Activities	Possible Environmental Impacts	Mitigating Measures	Monitoring parameters	Responsible Body
Mobilization/ Temporary facilities/ Construction/De-mobilization	• **Noise generation** from equipment & operations	• Use of modern, well maintained equipment fitted with noise enclosures • Schedule equipment movement during non-peak hours of daytime vehicular traffic • Avoid night-time construction activities and abide by local laws on construction hours • Equipment and machinery need to be shut down when not in use • Observance of standards norm of noise pollution • Provide silencers/mufflers for heavy equipment • Observance of seasonal sensitivity (breeding and animal mitigation seasons in the area)	• Public complaints received • Measure a noise level in case of complaints • Timing of operation activities	• Contractor • Site supervisor • PIU
	Waste, Inert and Hazardous Material Management			
	• Environmental pollution caused by improper **waste management**	• Preparation of waste management plan for safe disposal of management • Avoid use of hazardous material • Waste collection and disposal pathways and sites will be identified for all major waste types expected from construction activities. • Mineral construction will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. • Construction waste will be collected and disposed properly by licensed collectors • No open burning of wastes on or off site	• Periodic visits to sites • Visual inspection of separate waste management piles • Written receipts of all separate waste streams handled by the designated authorities • Visual inspection of burn marks on site	• Contractor for execution of civil works • PIU
	• Managing and disposal of **asbestos-containing waste**	• Prepare a work procedure for asbestos removal or maintenance in line with the *World Bank Good Practice Note: Asbestos: Occupational and Community Health Issues* (May 2009)[80] • Dispose asbestos-containing waste to a specially designated area at the landfill • Adhere to safety instructions at work, and workers must have appropriate protective equipment and masks • It is forbidden to mix asbestos waste with other types of waste	• Control of exposure to asbestos waste • During reconstruction, use the previous documentation if it exists, in order to determine the exact position and material of the pipe	• Contractor for execution of civil works • Site supervisor • PIU

[80] https://www.surrey.ca/sites/default/files/media/documents/WorkingWithAsbestosCementPipes.pdf

Project Phase / Activities	Possible Environmental Impacts	Mitigating Measures	Monitoring parameters	Responsible Body
			• Written receipts of asbestos-containing waste handled by the designated authorities	
	• Disposal of **special types of waste** due to replacement of water meters, pumps and painting of tanks	• Temporary store such waste in an appropriate manner and later dispose of it adequately • If dismantled old equipment is in working order, store it for spare parts • Old dismantled pipes and equipment (replaced with new, more efficient equipment), which are not in functional condition, sold as scrap metal • Dispose of cans of paints, varnishes, thinners in an appropriate manner and prevent them from spilling into water and soil • If possible, replace solvent-based paint with a water-based paint • Wash the painting equipment properly and in a safe place, so as not to pollute the environment	• Periodic visits to sites • Visual inspection of separate waste management piles • Written receipts of all separate waste streams handled by the designated authorities	• Contractor for execution of civil works • Site supervisor • PIU
Mobilization/ Temporary facilities/ Construction/De-mobilization	**Soil quality – pollution, erosion and vegetation cover**			
	• **Soil pollution** caused by waste disposal and oil spills	• Removal and dumping/burial waste at proper site • Storage and handling of lubricating materials in designated areas with soil protective measures and prohibition of discarding lubricating materials on site • Vehicles and machines need to be regularly maintained to prevent leakage of oil • Measurements to prevent accidental spills	• Periodic inspections • Monitor level of soil quality	• Contractor for execution of civil works • Site supervisor
	• **Soil erosion and landslides** due to clearing and/or excavation	• Control during earthworks to prevent degradation of terrain stability is required • Avoid steep slopes • Provide slope protection through bank compaction, riprapping on critical sections, or vegetative stabilization • The inclinations should be retained to prevent erosion and intensive side erosion process nearby the rivers and tributaries. • Designate a Spoils Storage Area, with topsoil set aside for later use and allow maximum re-use of spoils • Use material for restoration of degraded areas	• Presence of eroded areas near the site • Signs of a potential/imminent landslide (unstable soil, signs of slippage, etc.) • Regular inspection	• Contractor for execution of civil works • Site supervisor

Project Phase / Activities	Possible Environmental Impacts	Mitigating Measures	Monitoring parameters	Responsible Body
	• **Removal of vegetation**	• Do replacement planting that would restore removed vegetation • Secure: (i) environmental permit, (ii) Urban consent and (iii)Tree cutting consent	• Area replanted • Number and type of plants replanted	• Contractor
	Water Quality and Quantity			
	• **Increased surface and groundwater turbidity & siltation**, causing inconvenience in community use of the affected surface or ground waters along the path of the irrigation canals	• Set up sediment traps along rivers and/or gabions along banks to filter out eroded sediments • Proper drainage of spillage and mud water retrieved by rehabilitation and removal of silt • Same measures above for erosion control and slope stabilization	• Complaints received • Visually for presence of turbidity in surface water • Monitor level of bacteriological physical and chemical level in water • Analyze surface water quality in case of complaints (for pH, turbidity, conductivity and suspended solids) • If groundwater is used for drinking water supply, analyze tap water for drinking water • quality parameters as prescribed in national legislation	• Contractor • Site supervisor
	• **Oil & grease contamination of water bodies** due o for poor equipment M&R & refueling	• Provide oil & grease traps in stilling ponds • Provide ring canals around fueling tanks/motor pool/maintenance areas • Prohibition of discarding lubricants and other oil products into rivers/canals • Collect used oils in containers and hand over to authorized agency for handling	• Complaints received • Analyze surface water quality in case of complaints (for COD and total mineral oils) • If groundwater is used for drinking water supply, analyze tap water for drinking water quality parameters as prescribed in national legislation • Presence of oil film on water surface	• Contractor • Site supervisor
Mobilization/ Temporary facilities/ Construction/De-mobilization	**Biodiversity – Flora and Fauna**			
	• **Biodiversity can be negatively impaired** during the works period	• Careful location of ancillary sites so as to avoid critical habitat areas • Provide wildlife bypass area • Careful location of new extraction pits so as to avoid critical habitat areas • Careful location of dumping areas so as to avoid critical habitat areas	• Visual inspection • Analysis of flora and fauna of a given area	• Contractor • PIU

Project Phase / Activities	Possible Environmental Impacts	Mitigating Measures	Monitoring parameters	Responsible Body
		• Do not allow backfilling of shrubs and tree trunks with soil		
Mobilization/ Temporary facilities/ Construction/De-mobilization	**Cultural Property and Chance Findings**			
	• **Damage to cultural property** or chance findings which may be traversed reencountered during construction	• Stop the works and observe reporting and conservation protocols based on prior coordination with the responsible agency: Institute for Protection of Cultural & National Heritage	• Approval to continue or other relevant documentation from the nationally competent institution	• Contractor
Operation and Maintenance				
Maintenance	**Traffic and Pedestrian Safety**			
	• **Access restrictions** during maintenance	• Introduce appropriate traffic signalization and appropriate warning signs • Implementation of SEP, in particular the provisions on providing timely information to citizens through the media about upcoming maintenance, expected duration of the works, alternative routes, etc.	• Visual inspection of warning signs • Insight in information published	• Contractor
Maintenance	**Noise suppression**			
	• **Noise** emission and noise disturbance	• In case of noise complaints by local residents, the reduction of permissible vehicle speed limit should be performed	• Limit noisy activities (e.g. earthmoving, truck unloading, etc.) to the least noise-sensitive times of day and schedule activities to occur at the same time. Machinery should be shut down or throttled down to a minimum when not in use.	• Contractor
Maintenance	**Waste management**			
	• Improper **management of waste** from maintenance activities	• Waste collection and disposal pathways and sites will be identified for all major waste types expected from maintenance activities. • All waste will be collected and disposed properly by licensed collectors • No open burning of wastes/removed vegetation on or off site	• Visual inspection of separate waste management piles • Written receipts of all separate waste streams handled by the designated authorities • Visual inspection of burn marks on site	• Contractor

D. Indicative outline of ESIA

(a) Executive Summary

- Concisely discusses significant findings and recommended actions.

(b) Legal and Institutional Framework

- Analyzes the legal and institutional framework for the project, within which the environmental and social assessment is carried out, including the issues set out in ESS1, paragraph 26[81].
- Compares the Borrower's existing environmental and social framework and the ESSs and identifies the gaps between them.
- Identifies and assesses the environmental and social requirements of any co-financiers.

(c) Project Description

- Concisely describes the proposed project and its geographic, environmental, social, and temporal context, including any offsite investments that may be required (e.g., dedicated pipelines, access roads, power supply, water supply, housing, and raw material and product storage facilities), as well as the project's primary suppliers.
- Through consideration of the details of the project, indicates the need for any plan to meet the requirements of ESS1 through 10.
- Includes a map of sufficient detail, showing the project site and the area that may be affected by the project's direct, indirect, and cumulative impacts.

(d) Baseline Data

- Sets out in detail the baseline data that is relevant to decisions about project location, design, operation, or mitigation measures. This should include a discussion of the accuracy, reliability, and sources of the data as well as information about dates surrounding project identification, planning and implementation.
- Identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions.
- Based on current information, assesses the scope of the area to be studied and describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences.
- Takes into account current and proposed development activities within the project area but not directly connected to the project.

(e) Environmental and Social Risks and Impacts

- Takes into account all relevant environmental and social risks and impacts of the project. This will include the environmental and social risks and impacts specifically identified in ESS2–8, and any other environmental and social risks and impacts arising as a consequence of the specific nature and context of the project, including the risks and impacts identified in ESS1, paragraph 28.

[81] ESS1, paragraph 26, states that the environmental and social assessment takes into account in an appropriate manner all issues relevant to the project, including: (a) the country's applicable policy framework, national laws and regulations, and institutional capabilities (including implementation) relating to environment and social issues; variations in country conditions and project context; country environmental or social studies; national environmental or social action plans; and obligations of the country directly applicable to the project under relevant international treaties and agreements; (b) applicable requirements under the ESSs; and (c) the EHSGs, and other relevant GIIP.

(f) Mitigation Measures

- Identifies mitigation measures and significant residual negative impacts that cannot be mitigated and, to the extent possible, assesses the acceptability of those residual negative impacts. Identifies differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable.
- Assesses the feasibility of mitigating the environmental and social impacts; the capital and recurrent costs of proposed mitigation measures, and their suitability under local conditions; and the institutional, training, and monitoring requirements for the proposed mitigation measures.
- Specifies issues that do not require further attention, providing the basis for this determination.

(g) Analysis of Alternatives

- Systematically compares feasible alternatives to the proposed project site, technology, design, and operation—including the "without project" situation—in terms of their potential environmental and social impacts.
- Assesses the alternatives' feasibility of mitigating the environmental and social impacts; the capital and recurrent costs of alternative mitigation measures, and their suitability under local conditions; and the institutional, training, and monitoring requirements for the alternative mitigation measures.
- For each of the alternatives, quantifies the environmental and social impacts to the extent possible, and attaches economic values where feasible.

(h) Design Measures

- Sets out the basis for selecting the particular project design proposed and specifies the applicable EHSGs or if the EHSGs are determined to be inapplicable, justifies recommended emission levels and approaches to pollution prevention and abatement that are consistent with GIIP (if applicable).

(i) Key Measures and Actions for the Environmental and Social Commitment Plan (ESCP)

- Summarizes key measures and actions and the timeframe required for the project to meet the requirements of the ESSs. This will be used in developing the Environmental and Social Commitment Plan (ESCP).

(j) Appendices

- List of the individuals or organizations that prepared or contributed to the environmental and social assessment.
- References—setting out the written materials both published and unpublished, that have been used.
- Record of meetings, consultations and surveys with stakeholders, including those with affected people and other interested parties. The record specifies the means of such stakeholder engagement that were used to obtain the views of affected people and other interested parties.
- Tables presenting the relevant data referred to or summarized in the main text.
- List of associated reports or plans.

E. Indicative outline of site-specific ESMP

The content of the site-specific ESMP will include the following:

(a) Mitigation

- The ESMP identifies measures and actions in accordance with the mitigation hierarchy that reduce potentially adverse environmental and social impacts to acceptable levels. The plan will include compensatory measures, if applicable. Specifically, the ESMP:

  i) identifies and summarizes all anticipated adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement);
  ii) describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;
  iii) estimates any potential environmental and social impacts of these measures; and takes into account, and is consistent with, other mitigation plans required for the project (e.g., for involuntary resettlement, indigenous peoples, or cultural heritage).

(b) Monitoring

- The ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the environmental and social assessment and the mitigation measures described in the ESMP. Specifically, the monitoring section of the ESMP provides (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

(c) Capacity Development and Training

- To support timely and effective implementation of environmental and social project components and mitigation measures, the ESMP draws on the environmental and social assessment of the existence, role, and capability of responsible parties on site or at the agency and ministry level.
- Specifically, the ESMP provides a specific description of institutional arrangements, identifying which party is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).
- To strengthen environmental and social management capability in the agencies responsible for implementation, the ESMP recommends the establishment or expansion of the parties responsible, the training of staff and any additional measures that may be necessary to support implementation of mitigation measures and any other recommendations of the environmental and social assessment.

(d) Implementation Schedule and Cost Estimates

- For all three aspects (mitigation, monitoring, and capacity development), the ESMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the ESMP. These figures are also integrated into the total project cost tables.

(e) Integration of ESMP with Project

- The Borrower's decision to proceed with a project, and the Bank's decision to support it, are predicated in part on the expectation that the ESMP (either stand alone or as incorporated into the ESCP) will be executed effectively. Consequently, each of the measures and actions to be implemented will be clearly specified, including the individual mitigation and monitoring measures and actions and the institutional responsibilities relating to each, and the costs of so doing will be integrated into the project's overall planning, design, budget, and implementation.

MITIGATION PLAN TABLE FORMAT

Phase	Issue	Mitigation measure	Cost of mitigation (If substantial)	Responsibility*	Supervision observation and comments (to be filled out during supervision)
Preparation phase					
Project Execution / operate					
Post-project phase					

*Items indicated to be the responsibility of the contractor shall be specified in the bid documents

MONITORING PLAN TABLE FORMAT

Phase	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?	When is the parameter to be monitored- frequency of measurement or continuous?	Monitoring cost/ what is the cost of equipment or contractor charges to perform monitoring?	Responsibility*	Supervision observation and comments (to be filled out during supervision with reference to adequate measuring reports)
Preparation phase							
Project Execution / operate							
Post-project phase							

*Items indicated to be the responsibility of the contractor shall be specified in the bid documents

F. Minutes from the public consultations

TBA