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WB30-ALB-TRA-01
"Mediterranean Corridor: Murriqan –
Lezhë Route Highway Section,
Detailed Design, ESIA update,
Tender Documents":
ESIA Scoping Report DRAFT



Western Balkans Investment Framework
Infrastructure Project Facility
Technical Assistance 12 (IPF 12)
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Abbreviations

Abbreviation	Meaning
AADT	Average Annual Daily Traffic
AKUK	Agjencia Kombëtare Ujësjellës dhe Kanalizimeve/ National Agency for Water Supply and Sewerage Infrastructure
ALB	Albania
ANTP	Albanian National Transport Plan
AIC	Adriatic-Ionian Corridor
ARA	Albanian Road Authority
BAP	Biodiversity Action Plan
BCR	Benefit-Cost Ratio
BMP	Biodiversity Management Plan
BoQ	Bill of Quantities
CBA	Cost-Benefit Analysis
CBD	Convention on Biological Diversity
CEB	Council of Europe Development Bank
CESMP	Construction Environmental and Social Management Plan
CH	Critical Habitat
CMS	Convention on Migratory Species
CPT	Cone Penetration Test
DCM	Decision of Ministerial Council
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EEC	European Economic Community
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
ESR	Environmental and Social Requirements
E&S	Environmental and Social
EU	European Union
EUD	European Union Delegation

Abbreviation	Meaning
FIDIC	Fédération Internationale des Ingénieurs-Conseils
FIRR	Financial Internal Rate of Return
FNPV	Financial Net Present Value
FS	Feasibility Study
GHG	Greenhouse Gas
GIR	Geotechnical Interpretative Report
ICESCR	International Covenant on Economic, Social and Cultural Rights
IFI	International Financing Institution
IFICO	International Financial Institutions Coordination Office
ILO	International Labour Organisation
IPF12	Infrastructure Project Facility, Technical Assistance 12
JNKE	Junior Non-Key Expert
KoM	Kick-off Meeting
MEFA	Ministry of Europe and Foreign Affairs
MFE	Ministry of Finance and Economy
MIE	Ministry of Infrastructure and Energy
MoM	Minutes of Meetings
MoE	Ministry of Environment
NEA	National Environmental Agency
NIC	National Investment Committee
NTS	Non-Technical Summary
O&M	Operation and Maintenance
QA	Quality Assurance
PBF	Physical or Biological Features
PESIA	Preliminary Environment Social Impact Assessment
PIU	Project Implementation Unit
RSA	Road Safety Audit
RP	Resettlement Plan
SC	Steering Committee
SDR	Social Discount Rate
SEA	Strategic Environment Assessment
SEP	Stakeholder Engagement Plan
SNKE	Senior Non-Key Expert
SPC	Strategic Planning Committee
SPM	Senior Project Manager

Abbreviation	Meaning
SPP	Single Project Pipeline
SPT	Standard Penetration Test
TA	Technical Assistance
TCT	Transport Community Treaty
TEM	Trans-European Motorway
TEN-T	Trans-European Transport Network
TL	Team Leader
ToR	Terms of Reference
UDHR	Universal Declaration of Human Rights
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
VOC	Vehicle Operating Costs
VoT	Value of Time
WB	Western Balkans
WBIF	Western Balkans Investment framework

INCEPTION REPORT

NAME OF SUBPROJECT	Mediterranean Corridor: Murriqan – Lezhë Route Highway Section, Detailed Design, ESIA update, Tender Documents
WBIF SC APPROVAL DATE	WBIF Steering Committee in June 2024
APPROVED BUDGET	EUR 3,100,000
SUBPROJECT REF	WB30-ALB-TRA-01
BENEFICIARY	Ministry of Infrastructure and Energy
SECTOR	Transport
COUNTRY	Albania
LEAD IFI	European Bank for Reconstruction and Development (EBRD)
OFFICER RESPONSIBLE	Ilir Basha
SECTOR KEY EXPERT	Iro Dimitriadou
DATE	17 July 2025
VERSION	1

1 Introduction

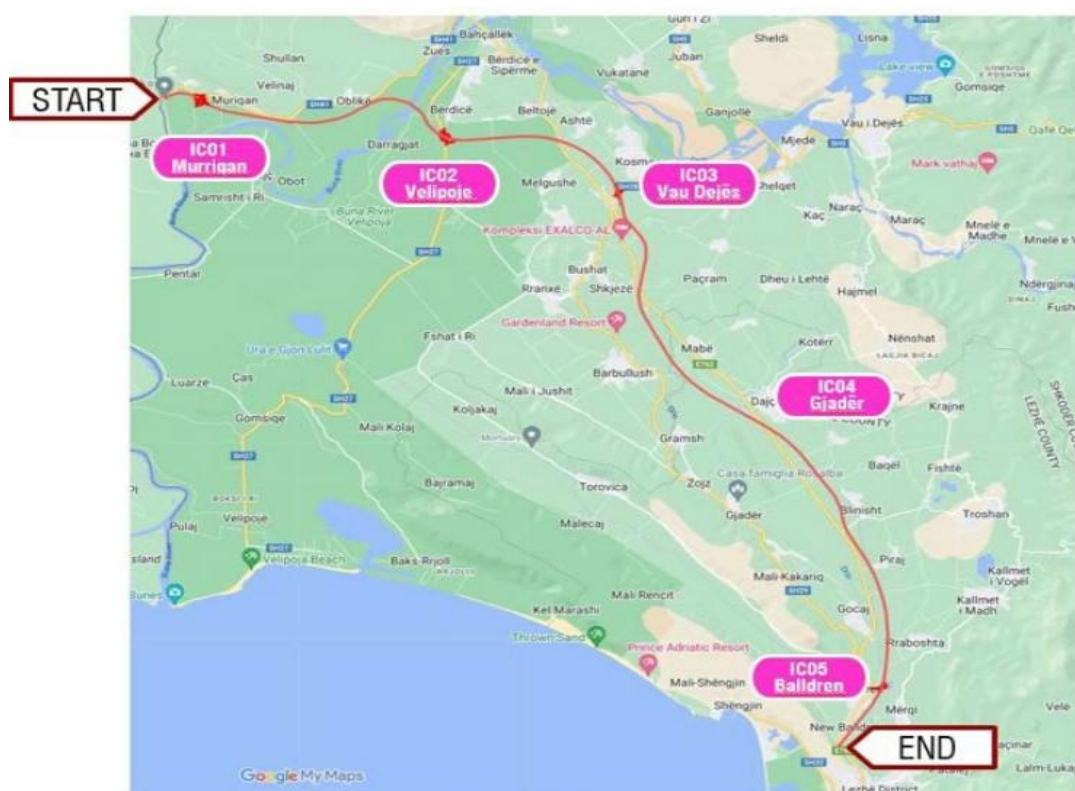
1.1 Background

The Project, subject of this Assignment, refers to the construction of the Murriqan/Sukobin (Albania/Montenegro border crossing) - Lezhë (Balldren) 40.4 km long highway section and the related ancillary road network.

In June 2024 the WBIF Steering Committee (SC) approved a grant for Technical Assistance (TA) of €3.1 million for the construction of the Murriqan – Lezhë section of the Adriatic – Ionian Corridor, Detailed Design, Environmental and Social Impact Assessment (ESIA) and Tender Documentation (grant WB30-ALB-TRA-01). The project will be implemented within the framework of Infrastructure Project Facility, Technical Assistance 12 (IPF12).

For this purpose, the International Financial Institutions Coordination Office (IFICO) Consultant prepared the specific ToR, based on which the IPF12 Team prepared the Methodology (approved on 26/05/2025) and the current Inception Report.

The purpose of the activities, as described in the ToR and the Methodology, is to prepare the Detailed Design, update and finalise the ESIA package, to prepare Tender Documents for the procurement of the construction project and to update the Cost-Benefit analysis (CBA) and Bill of Quantities (BoQ), so that the building permit can be issued and the works can be contracted under a Fédération Internationale des Ingénieurs-Conseils (FIDIC) Red Book contract.



Source: IPF12 – WB30-ALB-TRA-01 - ToR

Figure 1. Project layout

1.2 Project Objectives

As per the ToR, the overall objective of this Project is to enhance Albania's development of an efficient transport system, integrated into the regional and European road corridor networks, which should contribute to local and regional economic growth and development.

The specific objective is to support the construction of the Murriqan – Lezhë Highway section of the Adriatic – Ionian Corridor.

The Project is expected to generate the following measurable benefits:

- Socio-economic: Improved connectivity and accessibility to/from the region, reduction of traffic congestion, reduction of travel times, creating better opportunities for regional development, creating of better conditions for investing in the economy and increased productivity;
- Environmental issues: Reduction of noise levels and exhaust emissions in the cities of Lezhë and Shkodra;
- Safety concerns: Reduction of traffic accidents and improving road safety along the route.

1.3 Purpose of this Document

The overall objective of preparation the Environmental and Social Scoping Report is to be determined the key parameters, which may require additional attention during the preparation of the ESIA. The ESS Report is prepared in order to:

- Be in line with the national and international best practices and EBRD's ESRs;
- Provide a summary of the alternatives considered to date and the outcome of the process for selection of the preferred option for further development (subject to this scoping report);
- Identify environmental and social impacts potentially associated with the Project which should be considered in the ESIA (scope and methods to be applied in carrying out the ESIA);
- Inform and consult the stakeholders and discuss with them about:
 - The baseline information (including the existing facilities, environmental and social issues);
 - The relevant legislative requirements as those that arise from national, EU and EBRD standards;
 - The methodology of the ESIA assessment;
 - Possible conflicts with other existing and planned developments and
 - The specialist's studies to be conducted in the framework of the ESIA as well as the overall designing of the new planned developments.

This is also considered as an update of the Environmental and Social Scoping Report prepared in the previous, preliminary, phase.

1.4 Description of the scoping methodology

Preparation of the Environmental and Social Scoping Report is a very important phase of the ESIA procedure which starts in a very early stage of the ESIA procedure. In this case, the assignment refers to a review of the

available scoping report prepared for the preliminary design. This phase of the ESIA procedure provides an opportunity for the ESIA developers and the Competent Authority to determine the key environmental and social impacts and issues of concern that are likely to be of the utmost importance to the Project proposal's decision making and eliminates those that are less of a concern.

In other words, Scoping phase defines the content of the ESIA Report and ensures that the environmental assessment is focused on most significant effects caused by project's implementation.

Environmental and Social Scoping Report of the proposed project is prepared using engineering and baseline data to provide further detail of potential environmental and social effects caused by implementation of the Project. The Environmental and Social Scoping Report is prepared in accordance with the following methodology:

➤ **Identification of environmental and social issues**

Scoping includes a systematic consideration of Project activities and their potential impact on the environment and social aspects (physical, biological and social environment). For this purpose, identification of all environmental and social issues is conducted to determine activities, receptors and impacts of all phases of the Project. This process, supported by interdisciplinary consultations and meetings (between Designing team and ESIA team), enables a comprehensive identification of the Project's potential interactions (beneficial and adverse) with physical, biological and social environment. This information provides a reference for potential impacts that require further investigation during the ESIA process.

➤ **Desk-Based Studies – Review of Existing Baseline Information**

An important component of the Scoping phase is definition of the existing baseline conditions (i.e. the prevailing environmental and social characteristics against which the potential impacts of the Project can be assessed). Baseline conditions were outlined during the Scoping stage through a review of existing environmental and social data.

The main existing documents related to the project that were used as a basis for preparation of Environmental and Scoping Report as well as a basis for collection of other relevant data are:

- Conceptual Design for the preferred AI Road Corridor option, Adriatic-Ionian Road Corridor (Route 1 and Route 2) Montenegro and Albania, WB14-REG-TRA-01; September 2018; Western Balkans Investment Framework, Infrastructure Project Facility, Technical Assistance 5 (IPF 5);
- Feasibility Study for the Adriatic-Ionian Road Corridor (Route 1 and Route 2) Montenegro and Albania, WB14-REG-TRA-01; September 2018; Western Balkans Investment Framework, Infrastructure Project Facility, Technical Assistance 5 (IPF 5);
- Preliminary Environmental and Social Impact Assessment (PESIA) for Albania for the Feasibility Study for the Adriatic-Ionian Road Corridor (Route 1 and Route 2) Montenegro and Albania, WB14-REG-TRA-01; September 2018; Western Balkans Investment Framework, Infrastructure Project Facility, Technical Assistance 5 (IPF 5);
- Alternative Options Description Report, Feasibility Study for the Adriatic-Ionian Road Corridor (Route 1 and Route 2) Montenegro and Albania, WB14-REG-TRA-01; September 2018; Western Balkans Investment Framework, Infrastructure Project Facility, Technical Assistance 5 (IPF 5);
- Options Analysis Report for the Feasibility Study for the Adriatic-Ionian Road Corridor (Route 1 and Route 2) Montenegro and Albania, WB14-REG-TRA-01; September 2018; Western Balkans Investment Framework, Infrastructure Project Facility, Technical Assistance 5 (IPF 5);

- Available relevant information related to the project and existing baseline conditions that refers to the design, environment, geophysical and geotechnical survey data and reports relevant to the Project and the project area.
- Site visits and survey data, meetings with the stakeholders, etc.
- ESIA Scoping report, Mediterranean Corridor (Routes 1 and 2): Adriatic-Ionian Road Corridor in Albania and Montenegro, Murriqan-Lezhë section, ESIA and Preliminary Design, September 2022
- ESIA, Mediterranean Corridor (Routes 1 and 2): Adriatic-Ionian Road Corridor in Albania and Montenegro, Murriqan-Lezhë section, ESIA and Preliminary Design, October 2024

In addition to Project-specific information, other relevant data was collected and reviewed by the ESIA team, in order providing baseline environmental and social data relevant for the Project and Scoping phase (scientific journals, reports, national planning and strategic documents, statistical data, data provided from the municipalities in the project area etc.).

➤ **Field based investigation and monitoring**

Two site surveys were conducted by the ESIA team in the period of September and October. The surveys were used for highway alignment prospection and data collection. The existing baseline information used for the Scoping stage contributed to be formed the core of baseline information in the impact assessment. Taking into consideration the availability and scope of baseline data in this phase and required data that should be part of the ESIA, the ESIA experts during the Scoping phase proposed additional surveys and monitoring that should be carried and included in the ESIA.

➤ **Identifying Receptors**

The potential receptors of the likely project impacts were identified through both desk and field-based investigations. The potential receptors that may be affected adversely or beneficially, by the Project implementation that was taken into consideration and analyses are:

- Physical environment (air, water, soil);
- Biological environment (flora, fauna, habitats, landscape, forest, protected area); and
- Social environment (population, cultural heritage, materials assets).

Individual receptors within these groups were assessed as part of the impact assessment for their sensitivity to the potential impacts of the Project. Identified affected population was the basis for undertaken stakeholder engagement activities. In the chapter assessment of possible impacts on the environmental and social aspects were analysed the possible impacts on sensitive receptors that may be caused as a result of implementation of the project activities.

➤ **Analysis of Alternatives**

As a part of the methodology for preparation of Scoping report, is an analysis of the project's alternatives. For this reason, in the separate chapter the main findings of the previously prepared Multy-criteria analyses of the proposed alternatives that refers to technical, spatial, environmental and social aspects were taken into consideration.

1.5 Stakeholders

The Steering Committee

A Steering Committee (SC) which includes representatives of EBRD, European Union Delegation (EUD), MIE, Ministry of Finance and Economy (MFE), Ministry of Europe and Foreign Affairs (MEFA), Ministry of Tourism and Environment (MTE), ARA, Shkodra and Lezha Municipalities, created as of the project's kick-off, has an objective to monitor the project and issue the intermediary and final approvals.

The EBRD is the Lead IFI of the Project. It will closely monitor the activities and the results of the Project and, together with the Beneficiary, will review the deliverables of the Project and provide no-objection or comment upon them.

The local administration in Shkodra and Lezha Region will be involved especially in issuing the correspondent legal authorizations and permits for the Project.

The Beneficiary and the Implementing Authority

Exceptional role in the implementation of the project has:

- the Albanian Ministry of Infrastructure and Energy (MIE), as Contracting Authority and Beneficiary of the Project and
- the ARA, as Implementing Agency.

The MIE is the transport sector leading institution, in charge of creating and implementing the transport policy and strategy, including national strategies and action plans, inspections and enforcement. The MIE will closely monitor the Project to follow the overall national transport and infrastructure development priorities.

Furthermore, the MIE will closely monitor the project to follow the Albanian and EU design and construction standards and EBRD requirements.

The ARA is the national road network manager and is responsible for designing and implementing the programmes for planning, funding, construction, reconstruction, maintenance, and protection of the national road network.

The Project Implementation Unit

In the ToR of the project, it is envisaged that ARA will establish a PIU for the implementation of this Project.

The foreseen role of the PIU is to coordinate, manage, monitor, and evaluate all the aspects of the implementation, including procurement of goods, works and services, and environmental and social matters. Also, it is foreseen that the ARA, "in order to ensure an efficient activity of the PIU, shall ensure adequate resources and suitably qualified personnel, with experience in implementing the TA WBIF projects. The PIU will be led by a Team Leader (TL) appointed by ARA. The PIU will closely cooperate with the Consultant, who will assist the PIU with the implementation of the Project", will approve the outputs of the assignment, and it will be responsible for obtaining comments and approvals/no-objection statements from the other stakeholders, before their submission to the EBRD.

Other Key Stakeholders

The area of the project alignment crosses three adjacent municipalities:

- Shkodër Municipality,
- Vau i Dejës Municipality and

- Lezhë Municipality.

Local governments are responsible for preparing Local Development Plans, planning and developing water supply and sewerage systems, housing, local emergencies etc. In this regard a close communication and collaboration with the abovementioned municipalities is crucial to any new infrastructure project.

In addition to the local government, there are other stakeholders in the area that have an important relevance to the highway project. The Regional Directorate for Irrigation and Drainage (under the Ministry of Agriculture and Rural Development) is the responsible body for all the irrigation and drainage infrastructure in the area of the project. Given the mostly flat terrain and the presence of agricultural land, the area is rich with such infrastructure. Therefore, this Directorate is another crucial stakeholder to coordinate with. The same Ministry is represented in the area also with the Regional Agency of Agricultural Extension – Shkodër.

Other important local stakeholders are the National Agency for Water Supply/Sewerage and Waste Infrastructure (AKUM) and the Regional Environmental Directory of the National Environmental Agency (NEA).

The European Bank for Reconstruction and Development (EBRD) is the Lead IFI of the Project. It will closely monitor the activities and the results of the Project and, together with the Beneficiary, will review the deliverables of the Project and provide no-objection or comment upon them.

The local administration in Shkodra and Lezha Region will be involved especially in issuing the correspondent legal authorizations and permits for the Project.

2 Legal Framework

The ESIA must comply with the provisions of relevant national laws, the EBRD Environmental and Social Policy 2024 (EBRD Environmental and Social Requirements - ESRs), meet relevant EU standards and regulations, such as EIA Directive 2011/92/EU (amended in 2014 by Directive 2014/52/EU), Water Directive 2000/60/EC, Waste Directive 2008/98/EC and Directive (EU) 2018/851; Birds Directive 2009/147/EC, Habitats Directive 92/43/EEC, Directive 2008/96/EC on road infrastructure safety management, Directive 2002/49/EC on the assessment and management of environmental noise, multilateral conventions-Espoo Convention on Environmental Impact Assessment in a Transboundary Context and Aarhus convention and other relevant directives, conventions, related to environmental, health and safety presented in this chapter.

The ESIA should be aligned with the environmental policy objectives and measures defined in the National environmental strategies. When the National regulations differ from the EU environmental substantive standards, the Project is expected to meet those that are more stringent.

2.1 Project Organisation Overview of the Main Relevant National Legislation

2.1.1 National legislation for environmental impact assessment

In general terms, the Albanian Constitution that was adopted by Albanian Parliament in 1998 requires institutions to maintain a healthy environment, ecologically suitable for present and future generations. In the last decade and especially since 2001, number of laws and other legal acts on the environment have been drafted and approved. The Albania national legal framework is largely harmonized with EU legislation. The Albanian legal framework regarding environmental and socioeconomic issues is based on the Constitution of the Republic of Albania and consists of laws and regulatory acts, such as Decisions of the Council of Ministers (DCM), ministerial acts, regulations, guidelines and standards.

Environmental legislation is governed by the Law on Environmental Protection No. 10431, dated June 9, 2011¹. This Law sets out principles, requirements, responsibilities, rules and procedures to ensure a higher level of environmental protection and includes dispositions for environmental impact assessment as a tool for environmental protection, aiming to identify and define the possible direct and indirect effects on the environment mainly to prevent these effects.

Article 5 defines the principle of sustainable development: "Public authorities, through the development, adoption and implementation of normative acts, strategies, plans, programs and projects within their competence, promote sustainable economic and social development, using natural resources in order to meet current needs and preserve the environment, without prejudice the possibility of future generations to meet their own needs".

The Law on Environmental Protection establishes national and local policies on environmental protection,

¹ This law is harmonized with Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage. Official Journal L 143, 30/04/2004 P. 0056 - 0075

requirements for the preparation of environmental impact assessments and strategic environmental assessments, requirements for permitting activities that affect the environment, prevention and reduction of environmental pollution, environmental norms and standards, environmental monitoring and control, duties of the state bodies in relation to environmental issues, role of the public and sanctions imposed for violation of the Law.

Law on Environmental Impact Assessment and EIA procedure

The relevant national legislation relevant for the undertaking of an EIA is provided in Annex 1.

All projects associated with potential impacts on the environment, shall be subjected to an EIA prior to starting the implementation. The EIA report and other necessary documents will be submitted to the Ministry of Environment (MoE) who will transfer the project files to the national Environmental Agency (NEA) for review. The project shall be approved with Environmental Decision/ Declaration of the NEA and MoE. The procedure of EIA is detailed in the DCM No. 686 dated 29.07.2015 "On the rules, responsibilities, timelines for the EIA procedure and the transfer procedure of the decision for the environmental declaration" amended.

Based on the legal requirements of Law No.10440/ 2011, "On Environmental Impact Assessment" amended, Annex I point 7/ç "Construction of a new road with four or more lanes, or regulation and/or widening of an existing road, which has two or less lanes, in order to become four or more lanes, when the new road or its adjusted and/or extended section shall be 10 kilometers or more in continuous length" – The proposed project falls under the category of projects subject to a Full/In-depth EIA process. This project is classified to require a full EIA based on the national legislation and this was also confirmed during the initial meetings with NEA representatives during the first round of stakeholder engagement.

The documents required to be submitted to MoE along with the application for the Environmental Declaration include:

- Environmental Interaction Report
- Full EIA report
- Non-technical Summary
- Technical report summarizing the project
- A summary of consultation process with the public and other stakeholders, conducted during the EIA process
- A copy of the payment of the service fee as defined in the relevant legislation.

National, Regional and Municipal institutions with a role during the EIA process include:

- The Ministry of Environment,
- The National Environmental Agency,
- Regional Directory of Environment,
- National Agency of Protected Area,
- Regional Administration of Protected Areas,
- Municipality of Shkodra,
- Municipality of Lezha,
- Municipality of Vau I Dejes.

The Full/in depth national EIA procedure flowchart is illustrated in Figure 2 below. Based on the legal requirements of Law No.10440/2011, "On Environmental Impact Assessment" amended, Annex I point 7/ç "Construction of a new road with four or more lanes, or regulation and/or widening of an existing road, which

has two or less lanes, in order to become four or more lanes, when the new road or its adjusted and/or extended section shall be 10 kilometers or more in continuous length”.

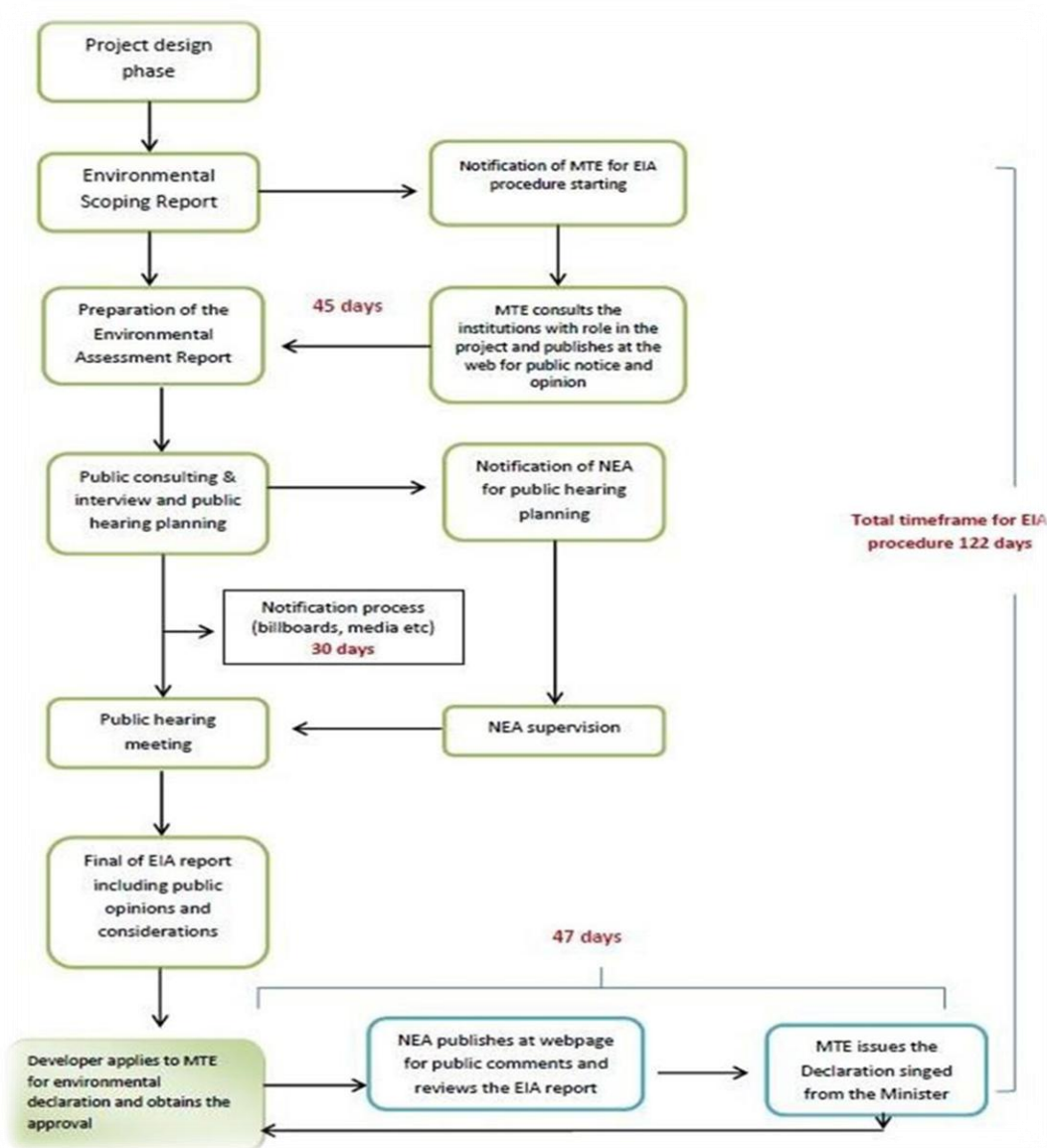


Figure 2 EIA Procedure and Timeline according to Decision of Ministerial Council (DCM) No.686 (29.07.2015) on “Approval of rules, responsibilities and timeframe of the environmental impact assessment procedure”

It is expected that at the end of the EIA process, the Ministry will decide on issuing an Environmental Declaration.

Although Albanian legislation requires an EIA, a more comprehensive Environmental and Social Impact Assessment (ESIA) report will be prepared to satisfy the project proponent’s and EBRD requirements.

Relevant National Legislation on Stakeholder Engagement and Participation

The preparation of the Environmental Impact Assessment Study for the project expects the full national environmental legal framework to be taken into consideration and the following legal acts will be used as a roadmap in terms of the stakeholder engagement and participation:

- DCM No 16, dated 14.01.2012 "On the public right for having environmental information";
- DCM No. 247 dated 30.04.2014 "On establishing the policy, requirements and procedures for public information and stakeholder participation in the decision – making environmental process";
- Law No. 119/2014, dated 18.09.2014 "On the Right of Information";
- Law No. 146/2014, dated 30.10.2014 "On Public Informing and Consultation";
- DCM No. 994, dated 02.07.2008 "On public involvement in environmental decision-making"; and
- Ministerial Guideline No.1, dated 03.03.2009 "On responsibilities of the environmental bodies to ensure the participation of the public and environmental NGO to the EIA process".

2.1.2 Other relevant national legislation related to the project

Law on Protected Areas and Biodiversity protection

The law No. 8906, dated 06.06.2002 "on the Protected Areas" laid down the framework for the proclamation, administration, management and sustainable use of protected zones and natural biological resources. The law also provides the basis for the development and mitigation of environmental tourism and other economic benefits and for the provision of information and education to the general public. The primary goal of the law is to provide special protection of the most important components of natural reserves, biodiversity and in general nature, through the implementation of a protected areas network based on the International Union for Conservation of Nature (IUCN) categories system. Furthermore, the law defines the priorities and strategic objectives for the management of each category of protected areas.

Protected Areas in Albania have been for the most part considered as forest areas and they have historically been administered by the Directorate General of Forestry and Pastures (GDFP) within the Ministry of Agriculture and Forestry. Within the law no 8906 /2002 "For the Protected Areas", the Ministry of Environment has been given the primary supervisory role for protected areas in Albania and is responsible for:

1. Proposing areas to be protected.
2. Preparing the legal and managerial procedures to propose and declare a protected area.
3. Compile management plans for protected areas.
4. On-going monitoring / regulation of management.

The law "For the Protected Areas" states that whilst the primary administrative role lies with the Ministry of Tourism and Environment and GDFP, the interests of other ministries should be considered. The protected areas of Albania include 15 National Parks, 5 Protected Landscape Areas, 4 Strict Nature Reserves, 26 Managed Nature Reserves, and other protected areas. Main protected areas are being equipped with trail markings, while reforms in administration such as the building of information centers are being gradually implemented. National Agency of Protected Areas (NAPA) is created by the Council of Ministers decision. No. 102, dated 04.02.2015, aimed management, protection, development, expansion and operation of the surfaces of protected areas, which today account about 16% of the territory of Albania. NAPA manages the network of protected areas and other natural networks as Natura 2000.

The Ministry of Environment, through the Directorate of Biodiversity and Protected Areas within the General Directorate of Environmental Policy and Delivery of Priorities, covers issues related to the drafting of policies

on nature protection as well as strategic documents development in this field. Cooperation is extended with other departments of the Ministry and with the following implementing institutions:

- National Agency of Protected Areas (NAPA);
- National Environmental Agency (NEA);
- The Regional Forestry Service Directorates;
- State Inspectorate of the Environment and Forestry.

Albanian legislation for the protection of biodiversity relevant to the Project is summarized in Annex 1

Law No. 81/2017 "On Protected Areas" defines the different categories of the PA's in Albania, and their management prescriptions. Albanian Law No. 81/2017 on PA's defines 7 categories of PA, each with varying degrees of protection that have been found to be present in the study area:

- Strict Nature Reserve (Category I),
- National Park (Category II),
- Natural Monument (Category III),
- Municipal Natural Park (Category IV),
- Protected Landscape (Category V),
- Protected Area of Managed Resource (Category VI),
- Protected areas of international interest (no specific protection category).

Key laws related to the protection of the environment and protected areas are listed in Annex 1.

Other relevant and applicable national legislation is listed in Annex 1 and includes the following:

- Legislation related to protection of the physical environment,
- Laws and Regulations in the Field of Cultural Heritage and Chance Finds,
- Legislation for the protection of cultural heritage,
- Laws adopted after the ratification of international conventions by the Republic of Albania,
- Health and Safety Framework,
- Relevant National Legislation on Stakeholder Engagement and Participation,
- Relevant National Legislation on Land Use and Territory Planning,
- International Conventions and Agreements Signed/Ratified in Albania.

2.1.3 National social legislation overview

The key national social legislation in Republic of Albania is covered by several set of laws and bylaws whose main description is presented below.

Territorial Administration

Law on Planning and Development of Territory –aims at ensuring the sustainable development of the territory through the rational use of land and natural resources; assessing the actual and future potential of the territory development on a local and national level by balancing natural resources with economic demand and public and private interests. . It also aims to coordinate the effort for: i) conservation of natural resources such as land, air, water, forests, flora and fauna; ii) creation of territories eligible for functional construction; iii) promoting the economic, social, and cultural life in local and national level; iv) safeguarding the resources of adequate supplies; v) providing for life safety, national security, public order and public health; and vi) promoting the balanced regional development to ensure sustainable distribution of population.

Labour related legislation

Law on Safety and Health at Work - This law ensures the security and protection of health through prevention of professional risks, eliminating the factors that constitute risk and accident, inform, advice, balanced participation in accordance with the law.

The Labour Code of the Republic of Albania regulates relations between employers and employees. The law reflects Constitutional principles, as well as the basic principles of international conventions on labour, trade unions, prevention of discrimination, etc. The code is widely considered a fair and effective law. The Labour Code provides for basic rights regarding the prohibition of compulsory labour, prohibition of discrimination, the freedom to join a trade union and collective bargaining. The Labour Code provides general rules for the employee's obligations and responsibilities, as well as the prohibition of competition after the termination of labour relationship. This Code also stipulates the duration of work and breaks, including daily and night work and extra payment; the weekly working time and holidays, the maximum duration of extra hours and compensation.

Law on Compulsory Insurance for Health Care in the Republic of Albania - Compulsory health insurance is based on the contributions of employees and employers of the state and from other sources for other persons, as provided for in this law, based on the principle of solidarity; Professional health care includes preventive measures and security, advising employers, employees and their representatives to demand the creation and preservation of a safe and healthy environment, in-service work and work adjustment skills of employees, taking into account their physical and mental state of health. It also includes the identification and evaluation of workplace hazards, monitoring of work environment factors and work practices that may affect employee health;

Expropriation and Private Property

Constitution of the Republic of Albania . The constitution of the Republic of Albania explains in article 41 subsection 4 that "Expropriations or the restrictions to property right that are the equivalent to the act of expropriation are permitted only on the basis of fair compensation".

Civil Code of the Republic of Albania - chapter on the right of ownership, regulating the right of compensation owners in cases of expropriation for public purposes. The Civil Code establishes the obligation to compensate for property damage which consists of the value of the damage caused and the expected profit (Art. 640).

The Law on Expropriation and Seizing for Temporary Use of the Private Property for Public Interest guides land acquisition and serves as a general framework for expropriation in the Republic of Albania. This Law provides for the State's right to expropriate or take private property for temporary use for purposes of a "public interest" that cannot be achieved or protected in another manner. The State must compensate the value of land expropriated and any reduction in the value of property caused to properties bordering with the expropriated property.

Law on Restitution and Compensation of Private Properties . This law serves the objective of regulating the restitution of property prior seized or expropriated by the country for the public interest, and in the case of its restitution being impossible, its proper compensation.

Law on Cadastre governs the registrations of immovable property transactions that occur after its entry into force. In addition, it introduces certain new principles on registration process, rights over immovable properties and related documents. The Law requires that all deeds related to immovable properties must be registered

and undergo a preliminary registration. Such preliminary registration is initiated with the online declaration of deeds by courts, notaries, bailiffs and other state authorities with the digital national cadastre.

The purpose of the Law on the Completion of the ownership transitional processes in the Republic of Albania is to establish a simplified and harmonized legal framework for the finalization of the transitional registration procedures of the state and private land consisting of:

- The registration of ownership titles of agricultural land;
- The finalization of the transfer to their users of the ownership of agricultural land previously owned by cooperatives and agricultural enterprises;
- The legalization and registration of illegal constructions, constructions without an ownership title and yards granted for use;
- The finalization of the inventory update process of public real estate; Handling of the problems related to the overlapping of ownership immovable property titles.

Law on the Registration of Immovable Property - It regulates the manner of registration of immovable property based on legal documents. It elaborates on preparation, keeping and administering immovable property registers which certify the right of ownership and other real rights on immovable property.

Law on Legalization, Urbanization and Integration of Constructions without Permits – The purpose behind this law is to regulate the legalization of informal buildings, facilities with permits with informal additions, functioning of the structures responsible for their realization, and the scope of implementation. This law is on the legalization of unpermitted constructed objects in “formal settlements”, “informal areas”, “other areas”, as well as “unpermitted additions to permitted constructions”. Another focus is on the transfer of ownership of the construction plot, where the unpermitted construction was erected, as well as the urbanization of informal areas, blocks and informal constructions and their integration in the territorial and infrastructural development of the country thus improving the living conditions. Finally, it also deals with the procedures for the realization of the legalization of informal areas/constructions and the establishment and functioning of the structures responsible for their realization.

Access to Information

The Law on the Right to Information regulates the right of access to information created or held by public institutions. The rules contained in this law are designated to ensure the public access to information, in the framework of assuming the rights and freedoms of the individual in practice, as well as establishing views on the state and society situation. This law aims also at encouraging integrity, transparency and accountability of the public institutions. The Ratification of the Aarhus Convention on public right to information, to participate in decision-making and to have access to justice in environmental matters in the Republic of Albania has been conducted in 2000 .

Cultural Heritage

The Law on Cultural Heritage and Museums is the primary legal framework governing the management of tangible and intangible cultural heritage in Albania. The Law aims to promulgate and protect the cultural heritage in the territory of the Republic of Albania. This Law, in relation to the field of territorial planning and development, defines inter alia:

- The cases of construction in public or private properties, which must obtain written approval from the National Council of Restorations and the National Council of Archaeology;

- Cases of excavations, restorations, uses and any other action in the cultural monuments, as well as any alteration on the ground under their protection, to be done with the authorization of the National Council of Restoration, Archaeological Institute, Archaeological Service Agency;
- The rules and types of constructional interventions in the Museum Areas, museum ensembles, historical centres, archaeological parks.

According to the law, if anything unusual will be found during the digging and excavation process the contractor has to stop immediately works, urgently inform the local authorities, the Culture Monuments Institute and the Ministry of Culture. They will send archaeologists and field specialists in order to check and evaluate the supposed archaeological objects and the works will restart only if the Culture Monuments Institute will issue the official permit.

Other Social related legislation

The purpose of the Law on equal gender society is:

- To ensure equal rights to women and men as provided for in article 18 of the Constitution of the Republic of Albania;
- To set out measures to promote equal opportunities for men and women aimed at eliminating direct and indirect discrimination on the grounds of gender in public life; and
- To set out the responsibilities of central and local administration for drafting policies aimed at promoting an equal gender society.

2.2 Overview of the Main Relevant International Legislation

2.2.1 EU standards and regulations

EIA Directive (85/337/EEC)

The EIA Directive (85/337/EEC) is in force since 1985 and applies to a wide range of defined public and private projects, which are defined in Annexes I and II. In Annex I, are listed projects for which EIA is a mandatory. All projects listed in Annex I are considered as having significant effects on the environment and require an EIA. For projects listed in Annex II, the national authorities have to decide whether an EIA is needed. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case-by-case examination.

The EIA procedure covered under EIA Directive (85/337/EEC) has few steps of implementation. Firstly, the developer may request the competent authority to say what should be covered by the EIA information to be provided by the developer (scoping stage). This is done through preparation of checklist given in Appendix 15.2., which is the same as the checklist prepared according to the national legislation.

In addition, the developer must provide information on the environmental impact (EIA report – Annex IV); the environmental authorities and the public (and affected Member States) must be informed and consulted; the competent authority decides, taken into consideration the results of consultations. The public is informed of the decision afterwards and can challenge the decision before the courts.

The EIA Directive of 1985 has been amended four times to bring it in line with the EU's international commitments and other legal developments. In 2011, Directive 85/337/EEC and its subsequent amendments was codified into a single new act (Directive 2011/92/EU) that is currently in force, amended by Directive 2014/52/EU.

Other related EU documents to the environmental impact assessment process are:

- Directive 2014/52/EU amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment;

- Directive 2003/35/EC providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC;
- UN ECE Convention on Environmental Impact Assessment in a trans - boundary context (UN ECE Homepage ESPOO Convention);
- Commission guidance document regarding application of exemptions under the EIA Directive – Articles 1(3), 2(4) and 2(5) (14.11.2019);
- Commission guidance document on streamlining environmental assessments conducted under Article 2(3) of the EIA Directive (26/07/2016);
- EIA guidance - Screening (2017);
- EIA guidance - Scoping (2017);
- EIA guidance - EIA report (2017);
- Guidance on the Application of the Environmental Impact Assessment Procedure for Large-scale Trans - boundary Projects;
- EIA Review Check List – 2001.

Other relevant EU policy for environmental and social issues relevant for the proposed project are:

- Paris Agreement, international treaty on climate change, IPCC;
- Albania revised Intended Nationally Determined Contribution (NDC);
- Directive on environmental information (2003/4/EC);
- Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage;
- INSPIRE Directive No. 2007/2/EC;
- Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on Industrial Emissions (Integrated Pollution Prevention and Control);
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy";
- Drinking Water Directive (98/83/EC) (currently under revision);
- Directive on the treatment of urban wastewater (91/271/EEC);
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration;
- Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration;
- Directive 2008/98/EC and Directive (EU) 2018/851 of the European parliament and of the council of 30 May 2018 amending Directive 2008/98/EC on waste;
- 2014/955/EU Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council;
- Commission Regulation (EU) No 1357/2014 of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives;
- European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste;
- Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) (recast);
- Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC;
- EU Construction and Demolition Waste Protocol and Guidelines, 2018;
- Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste;

- Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste;
- Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC;
- Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals (recast);
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006;
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC;
- Commission Regulation (EC) No 552/2009 of 22 June 2009 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards Annex XVII;
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe as amended by Commission Directive (EU) 2015/1480;
- Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants amended by Directive 2006/105/EC, 2013/17/EU and Regulation (EC) No 219/2009;
- Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC;
- Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air amended by Regulation (EC) 219/2009 2009 and Commission Directive (EU) 2015/1480;
- Directive (EU) 2016/802 of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the sulphur content of certain liquid fuels;
- Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC;
- Directive 2002/49/EC on the assessment and management of environmental noise;
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version);
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- Council Directive of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (89/391/EEC);
- Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile constructions sites (eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC);
- Council Directive of 30 November 1989 concerning the minimum safety and health requirements for the workplace (first individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC) (89/654/EEC);
- In 2004 the European Commission issued a Communication (COM [2004] 62) on the practical implementation of the provisions of directives, namely 89/391 EEC (framework directive), 89/654 EEC (workplaces), 89/655 EEC (work equipment), 89/656 EEC (personal protective equipment), 90/269 EEC (manual handling of loads);
- Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC);

- Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC);
- Council Directive 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work (ninth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC);
- Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC);
- Directive 2009/148/EC of the European Parliament and of the Council of 30 November 2009 on the protection of workers from the risks related to exposure to asbestos at work (codified version);
- Directive 2003/10/EC of the European Parliament and of the Council of 6 February 2003 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise) (Seventeenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC);
- European Directive 2002/44/EC on Exposure of Workers to Vibrations;
- Council Directive 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in employment and occupation;
- Council Directive 94/33/EC of 22 June 1994 on the protection of young people at work;
- Directive 2003/88/EC of the European Parliament and of the Council of 4 November 2003 concerning certain aspects of the organisation of working time;
- Directive 2006/54/EC of the European Parliament and of the Council of 5 July 2006 on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation (recast), etc.

2.3 EBRD Context

EBRD is a lead IFI and plays a supervisory role, monitors project activities and ensures that all deliverables meet the required standards before final approval. The ESIA shall comply with the EBRD Environmental and Social Policy 2024 and Environmental and Social Requirements (ESRs) as a binding requirements, along with the provisions of relevant national laws.

In accordance to the Environmental and Social Policy 2024, EBRD categorises each project to determine the nature and level of environmental and social investigations, information disclosure and stakeholder engagement required. This will be commensurate with the nature, location, sensitivity and scale of the project, and the significance of its potential adverse future environmental and social impacts. Environmental effects can be characterised as interactions between some of the Project's features and some of the surrounding environment's features.

Past and present environmental and social issues and risks associated with project-related existing facilities will be subject to environmental and social appraisal regardless of the categorisation. The EBRD policy classifies projects into distinctive categories, depending on the type, location, sensitivity, and scale of the project, including the nature and magnitude of its potential environmental impacts. These categories are as follows:

Category A: A project is categorised A when it could result in potentially significant adverse future environmental and/or social impacts which, at the time of categorisation, cannot readily be identified or assessed, and which, therefore, require a formalised and participatory environmental and social impact assessment process. A list of indicative Category A projects is presented in Appendix 2 of the EBRD Policy, 2024.

In alignment with EBRD ESR 10 (2024), the project shall utilize a multi-channel disclosure strategy. This includes a digital disclosure platform to ensure proactive and transparent access to E&S data, and inclusive formats, where all digital documents are optimized for accessibility.

Category B: A project is categorised B when its potential adverse future environmental and/or social impacts are typically site-specific, and/or readily identified and addressed through mitigation measures.

Environmental and social appraisal requirements may vary depending on the project and will be determined by EBRD on a case-by-case basis.

Category C: A project is categorised C when it is likely to have minimal or no potential adverse future environmental and/or social impacts, and can readily be addressed through limited environmental and social appraisal.

Initial Environmental and Social Examinations (IESEs) will be carried out where insufficient information is available at the time of categorisation to determine the appropriate category and scope of appraisal. Part of the ESIA process is this Environmental and Social Scoping report, which will serve to identify the potential future environmental and social impacts associated with the project. The Bank expects the clients to manage the environmental and social issues associated with the projects and to meet the comprehensive set of specific Environmental and Social Requirements (ESRs). Through the environmental and social appraisal and monitoring process given in the ESRs, the projects should be designed, implemented and operated in compliance with the applicable regulatory requirements and good international practice (GIP). The specific ESRs for key areas of environmental and social sustainability are as follow:

- ESR1 - Assessment and Management of Environmental and Social Risks and Impacts;
- ESR2 - Labour and Working Conditions;
- ESR3 - Resource Efficiency and Pollution Prevention and Control;
- ESR4 – Health, Safety and Security;
- ESR5 - Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
- ESR6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- ESR7 - Indigenous Peoples;
- ESR8 - Cultural Heritage;
- ESR9 - Financial Intermediaries;
- ESR10 - Information Disclosure and Stakeholder Engagement.

ESRs 7 and 9 do not apply to this Project. The Client should disclose all of the prepared environmental and social documentation to the public. EBRD Access to Information Policy provides that the Bank disclose ESIA for Category A projects 60 calendar days prior to consideration of the project by the Board of Directors for private sector projects and 120 calendar days prior to Board consideration for public sector projects.

2.4 Environmental and Social Screening Summary

In order to determine the categorization of the project, environmental and social screening by the environmental and social expert team was conducted based on the national legislation, EBRD policy and EU EIA Directive.

In accordance with the Albanian national legislation, specifically Law No. 10440, dated 7 July 2011 "On Environmental Impact Assessment", as amended, and the Decision of the Council of Ministers (DCM) No. 686, dated 29 July 2015 "On the rules, responsibilities and timelines for the environmental impact assessment procedure and the transfer procedure of the decision for the environmental declaration", the predicted project activities fall under Annex I, point 7/ç, which covers: "Construction of a new road with four or more lanes, or realignment and/or widening of an existing road of two or fewer lanes to become four or more lanes, where such a new road or its adjusted and/or extended section shall be 10 kilometers or more in continuous length."

Accordingly, the proposed project — the construction of the Murriqan–Lezhë highway section — is subject to a Full (In-depth) EIA procedure. For this type of project activity, preparation of a comprehensive EIA report is mandatory under national legislation and is a prerequisite for obtaining the Environmental Declaration from the MoE through the NEA.

In accordance with the EBRD Environmental and social policy (2024), the proposed project activities belong in Category A Projects, point 6. Construction of lines for long-distance railway traffic; airports with a basic runway length of 2,100 metres or more; motorways, express roads and new roads of four or more lanes, or realignment and/or widening of existing roads to provide four or more lanes, where such new roads, or realigned and/or widened sections of road would be 10 km or more in a continuous length. For this type of project activities which belong to Category A of the EBRD Policy, environmental and social impact assessment is mandatory.

The Bank will disclose the environmental and social impact assessment (ESIA) and associated documentation for Category A projects 60 calendar days prior to consideration of the project by the Board of Directors for private-sector projects and 120 calendar days prior to Board consideration for public-sector projects.

In accordance with the (EIA) Directive (2014/52/EU), predicted project activities belongs to Annex I, Point 7. (b) Construction of motorways and express roads. For this type of project activities which belong to Annex I of the Directive, environmental impact assessment is mandatory.

Regarding the mentioned above, the Client is required to carry out an Environmental and Social Impact Assessment (ESIA). The ESIA process includes a scoping stage to identify the potential future environmental and social impacts associated with the project which present in other words this ESS report.

The need of conducting trans-boundary procedure, under the Espoo Convention, shall be assessed as part of the ESIA study.

3 Project Alternatives

This chapter provides an information on the process of environmental and social assessment of the alternatives studied by the project developer as part of the previous technical documentation (Preliminary design phase, that builds on previous work - feasibility study and conceptual design phase).

3.1 Traffic analysis

Transport Demand Analysis was prepared as part of the overall project scope, initially to analyze the current traffic conditions on the motorway section "Murriqan - Lezhe" and then, to assess the future traffic on the new motorway section.

Following the collection and review of all available data and information regarding the network characteristics, the socio-economic zonal characteristics, the trip characteristics etc., the existing strategic traffic model was refined to better represent the area's connectivity along the Murriqan-Lezhe section, according to the final configuration of connections while the transport network consists mainly of the interurban road network of the municipalities Lezhe and Shkoder.

3.2 Do-Nothing Scenario

The 'do-nothing' scenario ('no-action' option) is an alternative involving no development of the Project. In other words, this is the present topology and quality of the road network in the Project area and, in wider context, in Albania, with the present state of equipment and serviceability.

A 'do-nothing' scenario has been considered as an alternative to the Project in the previous planning phases. The following conditions are likely to remain or occur if the Project does not proceed:

- Road congestion will remain and will increase in the future, and with that all related safety and environmental impacts.
- The condition of the road infrastructure in the region will remain low.
- There will be no stimulus to the development potential of the area.
- Road safety issues will remain.
- Travel times will increase as traffic volumes increase over time.
- Access to people, goods, services, and employment opportunities will not be improved along the highway corridor.
- Economic growth will be constrained, and investment will decline.
- The strategic plans and goals of the Government of Albania will not be realised.

In a scenario where the Project is not implemented, the biodiversity and landscape will remain unchanged, there will be no land conversion and no demolition of structures along the highway alignment. However, the air quality and noise impacts along the existing state roads related to the existing and frequent congestions will continue to worsen as traffic levels and congestion increases, particularly as other sections of the existing state roads are improved.

Based on these considerations and in terms of fulfilment of the Albanian strategic goals, 'do-nothing' alternative is considered to be unacceptable, mainly due to the Project being an integral part of the wider transport network, which is part of the existing regional transport corridors.

3.3 Assessment of the alternatives studied by the project developer and selection

Assessment

Further development and modernization of Albania's transport infrastructure is a high priority of GoA. The FS study team, while identifying the proposed alternative route options, also focused on eliminating as much as possible the negative impacts on environmental protected areas and nature/culture monuments, while respecting and validating those distinct landscape features and beauties observed along the AIC route. For the purpose of the feasibility Study, numerous relevant studies for Albania had been collected and reviewed.

The selection process for the preferred Project option has taken into consideration the AIC as a whole. The Multy Criteria Analysis (MCA) has been performed in two key steps. The criteria categories chosen for the project as a whole included Engineering and Technical, Economic, Transport, Environmental and Social and Financial Criteria.

Identified Alternatives in Section 1 of AIC, from Murriqan to Lezhe

Two routing variants have been identified and further assessed in the section-1 of AIC (Murriqan - Lezhe (Balldren)):

- Alternative 1A (magenta dashed line) – completely new alignment. This variant has length of approx. 27.5 km and generally follows a northwest – southeast direction and consists of a completely new construction. However, this alternative produced quite large amount of earthworks and bridges, which increased its cost dramatically. Along this alternative only two interchanges have been foreseen, due to the fact that there are not many developments in the area. This alternative crosses the central (core) area of the protected area of Buna River² in approx. 1.2 km long section.
- Alternative 1B (green continuous line) – new alignment (approx. 13 km) and doubling of existing road (approx. 25.8 km). This variant has length of approx. 38.8 km and in the first 1/3 of its length (up to intersection with national road Sh1) follows west-east direction, while along the remaining length it follows a northwest – southeast direction. This alternative foreseen six interchanges and a considerable number of service/local roads. At the crossing point with Buna River, a 700 metres long bridge has been foreseen to be built. This alternative crosses the outmost northern peripheral part of protected area of Buna River in approx. 0.939 km long section.

² Protected Landscape Buna river-Velipoja, designated as a legally protected area according to the respective Albanian legislation. This site and its wider area is also internationally recognised area, with multiple designations: an Emerald Site; Important Plant Area (IPA) and Important Bird Areas (IBA). In addition, it forms part of one of three designated Ramsar sites within Albania - Lake Shkodra and River Buna.

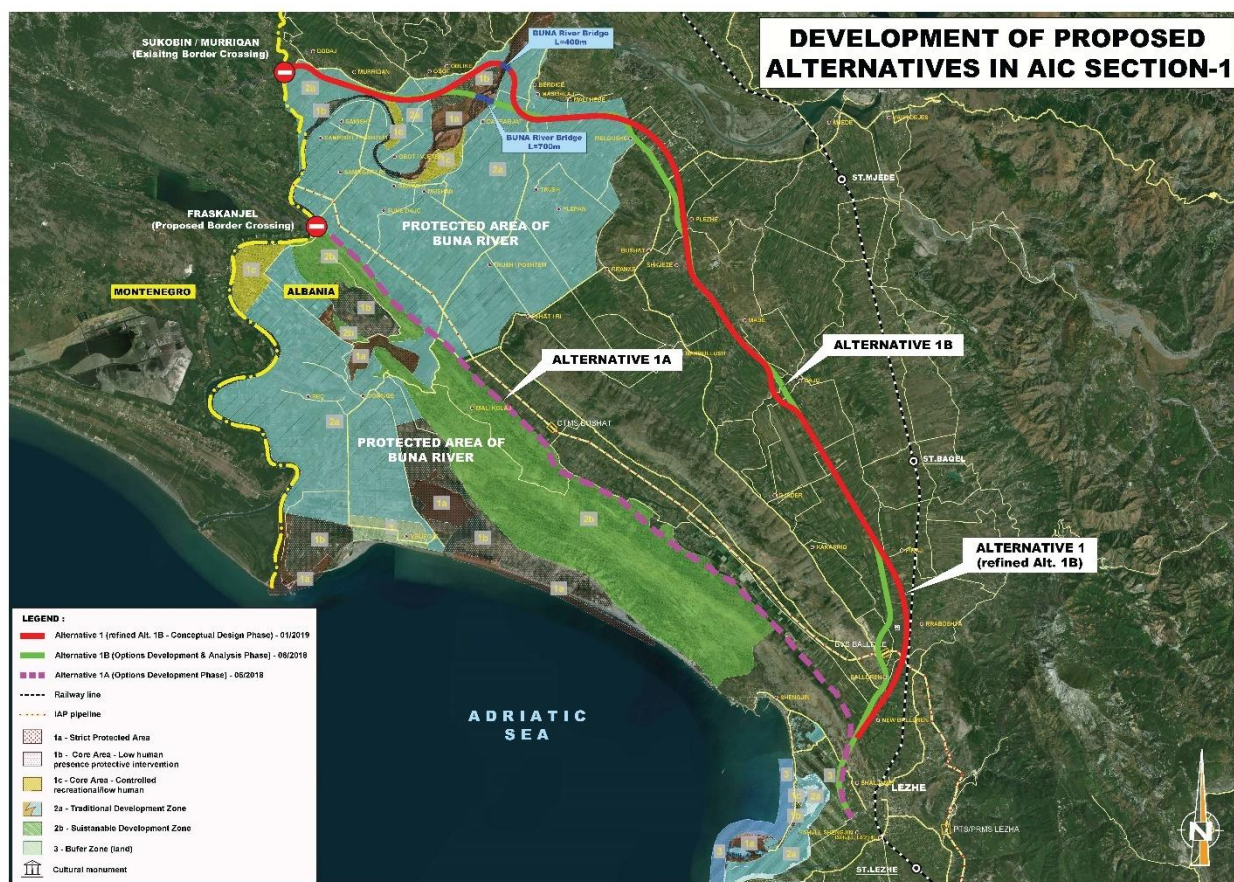


Figure 3: General map of proposed alternatives during Feasibility Study (2017-2019)

Selection

For these alternatives, dedicated drawings and bill of quantities has been prepared to further guide the consultation between countries and selection of the preferred project option. As part of the stakeholder engagement process, results of these analyses have been presented at a Stakeholders Joint Workshop, held in Shkodër on 11 July 2018, with the presence of respective representatives from the key statutory stakeholders (Beneficiaries) – the Ministry of Infrastructure and Energy (Albania) and the Ministry of Transport and Maritime Affairs (Montenegro).

The Beneficiaries decided to exclude Alternative 1A from further assessment and to put Alternative 1B as only viable option on Section 1 from Murriqan to Lezhe for further development, i.e. Conceptual Design (completed in 2021) and later Preliminary Design and accompanying ESIA (completed in 2024).

During the Conceptual Design stage, the preferred option in Section 1 from Murriqan to Lezhe (initially defined as Alternative 1B) had been further refined regarding the minimization of adverse E&S effects with emphases to impact on the protected area and sensitive zones of Buna River and avoiding particular important developments along the route (near Vau Dejës, Melgushe, Baldren). In that respect, partial realignments and vertical gradient improvement to avoid as much as possible the core zones this designated area have been considered, by applying a horizontal radius (R) of 720 metres and a bridge with a length of 400 metres. This updated version of preferred option (Alternative 1B) is shown in the above Figure (line in red colour). Based on this approach to avoid potential adverse impacts, i.e. by implementing the principle 'mitigation by design', a high level of primary mitigation has been achieved and is embedded into the design to date.

3.4 Optimization of Preferred Option (improvements of the Conceptual Design)

Following a thorough examination of all data, during development of the motorway alignment, the design team has identified areas where local improvements of the initial alignment could be applied and consequently a (locally) modified, improved alignment has already been under consideration³. It should be noted that the modified alignment does not deviate from the concept/corridor of the conceptual design. However, during the Preliminary design process the Consultant has identified the criteria for assessing/evaluating the consequences of each option (optimized alignment vs existing FS alignment):

- Technical Aspects (such as alignment geometrical data, any existing structures and houses, flooding areas, construction feasibility, existing irrigation networks, existing local road networks and other utility networks etc.)
- Environmental aspects (existing protected areas, flooding areas, historical and cultural monuments, high cuts/embankments etc.)
- Social aspects (inhabited areas, existing spatial plans, existing roadside retail, industrial and public use buildings etc.)

Based on the existing data acquired by the Consultant, the initial alignment prepared in the context of the recently approved Feasibility Study (FS, 2019) was reviewed in relation to potential conflicts and dependencies of the corridor with other existing or planned utilities and networks, as well as to the land use in the wider area (including protected areas e.g. at the Buna River). In addition, the geometry of this initial alignment has been also reviewed.

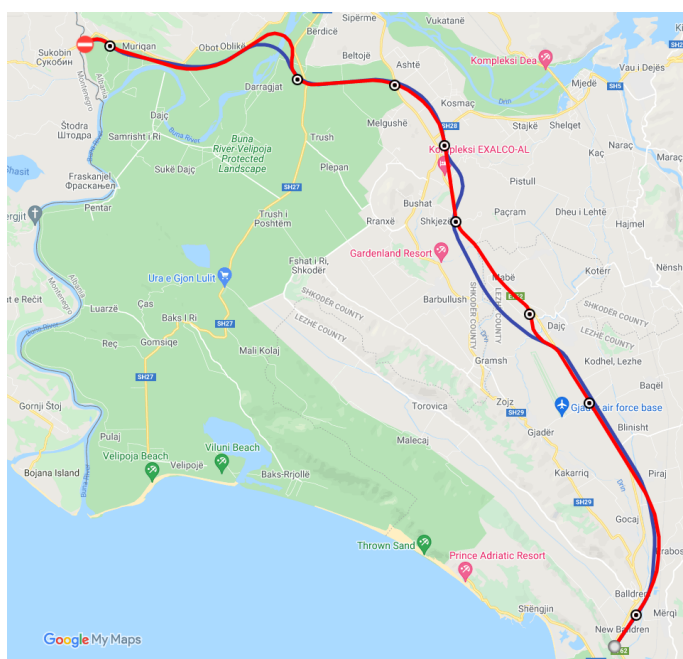


Figure 4: General map of the project (conceptual alignment-red vs. modified alignment-blue)

The modified alignment does not deviate from the concept of the initial design, while several issues considered as crucial for the feasibility of the motorway, related both with construction and operating aspects of the motorway, are tackle and appropriately examined:

³ Mediterranean Corridor (Routes 1 and 2): Adriatic-Ionian Road Corridor in Albania and Montenegro, Murriqan-Lezhë section ESIA and Preliminary Design

- Interference with the final location of the planned WWTP of Shkoder,
- Houses⁴ that should be demolished by the initial alignment, are avoided and preserved by applying slight modifications to the initial alignment,
- Adverse consequences on the inhabitants should be minimized. On this basis, the village of Plezhë is proposed to be by-passed from the east,
- Avoid as much as possible conflicts with the existing high voltage electrical lines,
- Avoiding areas of historical and cultural/social significance (from Ch. 38+000 up to the end of the project),
- etc..

All the proposed modifications to the alignment of the FS, has been thoroughly implemented in the context of the preliminary design. The consideration of the design team is that these modifications will significantly improve the final outcome on several levels (constructional, operational, maintenance, safety), without altering the basic concept.

4 Project description

4.1 Project rationale

Adriatic-Ionian Corridor (AIC) is part of the Western Balkans Core Road Network as well as part of the indicative extension of the TEN-T Network to the Western Balkans region, which was officially adopted in 2016 (EC Regulation 2016/758 amending Regulation No. 1315/2013). More specifically, the AIC will be part of the Mediterranean Road Core Network Corridor (CNC), together with Corridor Vc in Bosnia and Herzegovina.

⁴ House close to ch. 14+800 of the initial alignment



Figure 5: Adriatic-Ionian Road Corridor (AIC)

Source: Wikipedia

The Murriqan/Sukobin - Lezhë (Balldren) is the first sub-section of the AIC motorway in Albania, connecting Montenegrin/Albanian border with Lezhë (Balldren).

The road alignment is designed considering the selected alignment option developed under the Conceptual Design which was confirmed by the Albanian Ministry of Infrastructure and Energy (MIE) (Beneficiary), in line with Albanian guidelines and standards, applicable EU standards, as well as international standards and motorway engineering practices.

The area of the project alignment crosses three adjacent municipalities:

- Shkoder Municipality,
- Vau i dejës Municipality and
- Lezhe Municipality.

4.2 Project identification

4.2.1 Dependencies with other projects

In order to facilitate the realization of the project, the Consultant in the previous phase took into consideration other projects or studies in the study area. The main focus is addressed on projects of national importance and envisaged in the near future such as spatial plans, connection with previous and next sections of AIC, Railway line Vora - Han i Hotit, Ionian Adriatic Pipeline, Waste Water Treatment Plant of Shkoder (WWTP), High voltage electrical lines, Pumping Station at Balldren.

4.3 Studies and surveys

The preliminary design included wide range of studies and surveys:

- Geodetic study and surveys
- Geology works and study
- Seismic study
- Hydrogeological study

4.4 Project Description

4.4.1 Road design

The use of Albanian Road Design Manuals (RrTPRr, 2015) and TEM Standards and Recommended Practice (UNECE-Third Edition, February 2002) are as the main base for the development of the preliminary design.

The typical cross section of Murriqan - Balldren section generally follows the motorway category A with a design speed of 120 km/hr.

The following standards, norms and regulations are followed during the development of the Highway Preliminary Design:

- TEM Standards and Recommended Practice (UNECE, 3rd Edition, February 2002)
- Albanian Road Design Manual (Vol.2 – Geometric Design)
- Terms of Reference for Preliminary Design for the "Adriatic-Ionian Road Corridor in Albania and Montenegro, Murriqan-Lezhe section" (WB24-ALB-TRA-01)
- Other international or local approved standards, necessary for the detailed design of low-speed local roads.

The main design parameters to be applied during the preliminary design of Murriqan-Balldren in the table below.

	Parameter	Minimum values
GENERAL	Design speed on the highway	120 km/h
	Min/Max length of straight line	6Vr/22V
	Min stopping sight distance (SSD)	RrTPRr-2, Fig. 5.6
LOCATION PLAN	MinR horizontal curve	720 m
	MinL horizontal curve	65 m
	MinA parameter	270
PROFILE GRADE	MinR convex for vertical curves	16,000 m
	MinR concave for vertical curves	8,800 m
	Max gradient	4.0%
	Min. gradient	0.7%
	Min. gradient on bridges	0.5%
	Min crossfall	2.5%
	Max crossfall (open section)	7.0%

	Parameter	Minimum values
	Max crossfall (on bridge)	5.0% (acc. to RAA 2008)
	Max gradient in tunnels and facilities	T < 1,000 m, i ≤ 4% T ≥ 1,000m, i < 2.5%

The typical cross section of Murriqan-Balldren section generally follows the motorway category A cross section according to Albanian Road Design Manual (RrTPRr-2) and TEM Standards and Recommended Practice (2002), for design speed $V_D=120$ km/h.

Similar to the main highway design, the interchanges are also designed according to the Albanian Road Design Manual (RrTPRr, 2015), the TEM Standards and Recommended Practice (2002) and other relevant international design standards.

4.4.1.1 Alignment

The proposed alignment is designed as motorway of category A according to both Albanian Road Design Manual (2015) and TEM Standards and Recommended Practice (2002). It lies almost 100% over flat terrains passing through agricultural lands and a dense irrigation and drainage ditches network. The alignment has a total length of 40.4 km.

Based on its geographical position, orientation and its characteristics, the proposed alignment could be divided into three distinct sub-sections.

First sub-section (Ch. 0+000 – Ch. 13+550) starts at the border with Montenegro (Sukobin/Murriqan) up to the first intersection with SH1 national road. It extends in east-west direction for about 13.55 km.

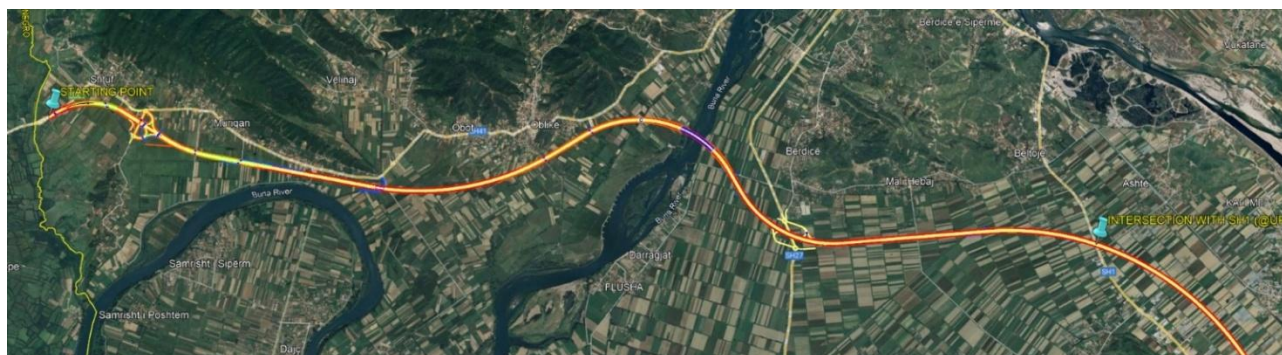


Figure 6 General layout of the first sub-section (Ch. 0+000 – Ch. 13+550)

Source: The Consultant

Second sub-section (Ch. 13+550 – Ch. 26+830) runs from first intersection with SH1 national road (Ch. 13+550) up to the third intersection with SH1 national road (at IC04, near Gjadër air force base, Ch. 26+830) and generally follows north-south direction, similar to the Sh1 national road.

Third sub-section (Ch. 26+830 – Ch. 40+390) runs from the third intersection with SH1 national road (at IC04, near Gjadër air force base, Ch. 26+830) up to the ending point (before the tunnel) and generally follows northeast – southwest direction.



Figure 7: General layout of the second sub-section (Ch. 13+550 – Ch. 26+830) (left) and General layout of the third sub-section (Ch. 26+830 – Ch. 40+390) (right)

Source: The Consultant

4.4.1.2 Interchanges

4.4.2 The interchanges are the only means on a motorway that provide entry/exit access to the users. Interchanges are composed by different functional elements, which interact spatially to each other, such as the main travelled part by through traffic, entry/exit areas in conjunction with other highways or local road network, linking ramps, etc. Total of 5 (five) interchanges are proposed.

The local road network has taken into consideration the existing conditions as well as the network provided by affected Municipalities of Shkodër, Lezhë and Vau Dejës, as the main base for the design purpose.

Total of 77 local roads divided in 7 types are covered with the design, with a total length of about 30 km and a design speed of 20-40/30/40-60 km/h, located in 19 different villages.

4.4.3 Major Structures

According to the road design one extradosed bridge is to be constructed for both traffic directions. The total deck width is 29.50m comprising two (2) traffic lanes of 3.75m and one (1) emergency lane of 3.00m for each traffic direction.

The proposed motorway alignment interrupts in a lot of places the existing alignment of many local and national roads. Total of 40 underpasses are foreseen along the road alignment.

4.5 Raw materials, auxiliary materials, wastewater and waste

The construction of the road implies intensive construction works that include earth, concrete, asphalt and other works and the use of various types of construction materials on a large scale, according to the type and scale of the project, as well as the large-scale use of construction vehicles and mechanization.

According to the preliminary design, the general site clearance and grubbing is estimated to be on more than 350 ha of area. The excavation works will include excavation of topsoil and cuts where necessary and it is estimated to be more than 2.600.000 m³ of soil, covering the motorway and the five interchanges, where as the necessary filling is estimated at about 16.000.000 m³ of soil.

4.6 Significant quantities of mineral raw materials such as unbound gravel and gravel for concrete and asphalt would be necessary. Integration with the EBRD Green Economy Transition Strategy

In regards to climate change aspect, the ESIA update shall also consider the EBRD Green Economy Transition approach and identify potential EBRD Green Economy Transition opportunities, such as environmental innovation and benefits (waste minimisation and resource efficiency) and climate resilience.

In assessing the project's alignment with EBRD's Green Economy Transition strategy, the ESIA update shall focus on also on evaluating environmental benefits such as waste minimization and resource efficiency and assessing the opportunities to reduce the construction Greenhouse Gas (GHG) emissions of the project by the use of low carbon materials in the project Detailed Design, by recycling materials where possible or by considering the sourcing of materials

4.7 Associate facilities

Typical Associated Facilities for a road infrastructure related to the construction phase considered in the revised EDSIA include the following:

- Borrow pits and quarries supplying aggregates,
- Asphalt plants (existing or newly established),
- Concrete batching plants,
- Construction camps (workers' accommodation, yards),
- Temporary access roads and detours,
- Spoil disposal / surplus material disposal sites,
- Fuel storage and refuelling stations.

5 Description of the existing environment

5.1 Basic Environmental Aspects in the Project Area

In this section presented are the basic environmental aspects based on the desktop analysis, site visits/investigations and Environmental Baseline Report.

This section describes the main components of the physical and natural baseline environment and the social context in the area affected by the implementation of the Project. The characterisation of the existing environment along the road corridor involves a desk review of a wide range of existing data sources and

reports which includes the baseline prepared as part of the previous ESIA for the preliminary design, collections and review of updated data as well as field walking surveys to update knowledge and understanding of terrain and settlements.

As a result of the data gaps identified in the previous scoping phase, a set of environmental, biodiversity and social surveys were conducted during 2023 to provide sufficient and necessary data, as following:

Environmental surveys:

- Baseline ambient air quality survey,
- Baseline surface water quality survey,
- Baseline soil quality survey,
- Ambient noise survey together with Noise dispersion modelling.

Biodiversity surveys focused on:

- mammals including bats,
- birds,
- amphibians and
- reptiles.

Social surveys:

- field walks,
- Socio-economic survey.

5.1.1 Project influence area

The implementation of the project activities will be conducted on the territory of the following three municipalities: Shkoder, Vau i dejës and Lezhe. Implementation of the project activities during the construction phase may affect the environmental and social conditions in the surrounding as a result of generated emission (air, water, soil, noise, vibration), removal of vegetation and forest, changes in the land use, ownerships, limited access to existing roads agricultural land, industrial facilities, etc. Operation of the motorway may affect environmental and social conditions in the surrounding as a result of generated emission (air, water, soil, noise, vibration).

In order to give an appropriate assessment of potential environmental and social impacts and assessment of the cumulative impacts in construction and operational phase, the ESIA team has defined the project footprint, the project area of influence on the base of predicted project activities, conditions on the site, guidelines, policies etc, and additionally, further on an ecologically appropriate area of analysis (EAAA) will be defined.

Project footprint is the area on a project site used to install and construct all necessary structures, defined by the perimeter of the project. In other words, the area of land directly affected by project disturbance is defined as project footprint. The project footprint is the area where the alignment is positioned together with the structures (bridges, underpasses, cuts and covers etc.).

Project area of influence (AOI) is the area where significant environmental and social impacts caused by the project performance are evident on physical, biological and socioeconomic components. The project area of influence varies according to the project activities and environmental and social components. The project area of influence includes the areas where the planned activities of the project will take place (project footprint), but also the areas that may be subject to direct and indirect impacts on the natural and human environment as a result of the construction and operation of the motorway. In other words, despite of the project components, the project area of influence includes the existing regional road, the surrounding agricultural lands, natural habitats, rivers and drainage channels, existing industrial and commercial facilities, settlements and residential areas/houses etc.

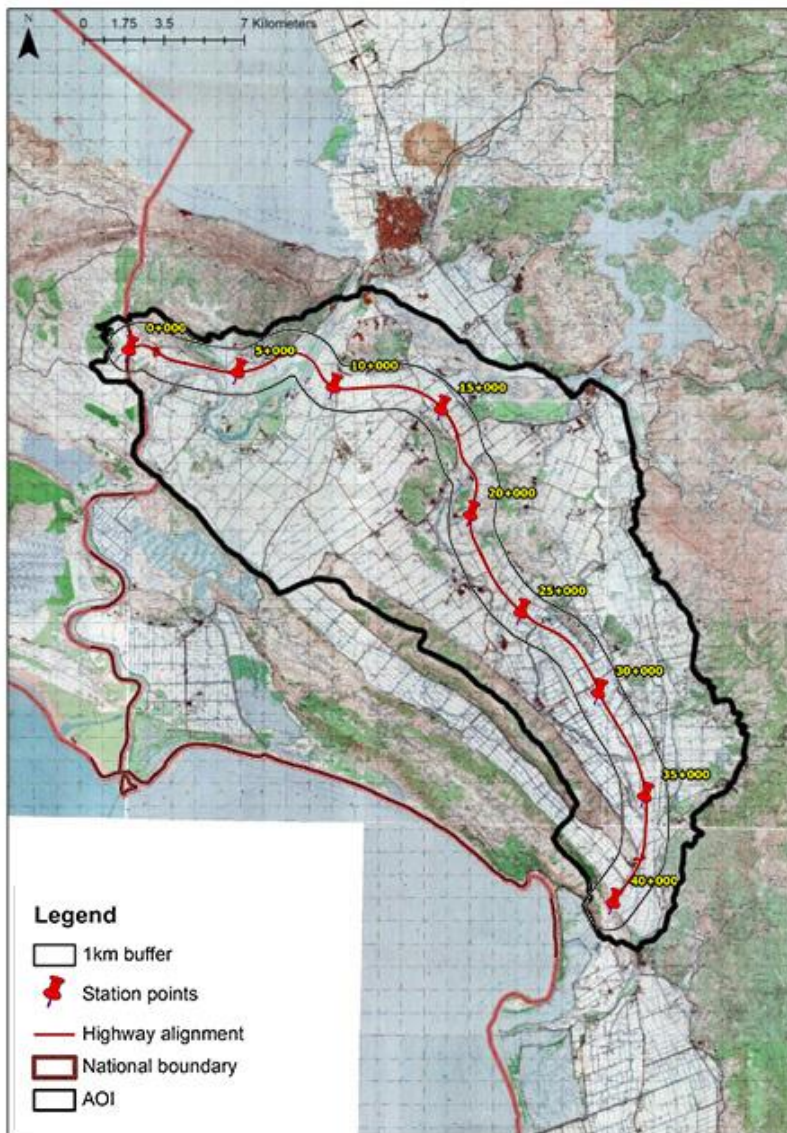


Figure 8 Area of interest

The overall project area of influence includes the physical, environmental (air, water, waste, noise etc), social and nature/biodiversity aspects:

- Areas physically occupied by motorway infrastructure and project facilities or where project activities will be carried out (area of direct impact which was used for the assessment of direct destruction of terrestrial habitats);
- Areas that may be affected by emissions and effluents, even if relatively distant from project footprint;
- Areas occupied or affected by associated structures and objects (access roads, disposal sites, toilets, etc.);
- The physical footprint of non-project activities in the surrounding area that are caused by or stimulated by the project ("induced growth"), plus any areas affected by their emissions and effluents. These are generally the result of changing economic or social patterns catalysed by the project's presence, such as human settlement associated with in-migration of people seeking work in a project. This can "open" areas to exploitation, exacerbating destruction of natural habitat (e.g. increased access to sensitive areas as a result of new roads or rights-of way). In some cases, a project's indirect impacts can greatly exceed its direct impacts.

The Area of Interest (AoI) is defined with consideration of the broader natural environment of the motorway alignment.

This area was defined taking into account the natural borders in the geomorphology of the area (ridges of hills and mountains forming a distinct part of the wider watershed as well as major river flows). Starting from the confluence of Buna and Drina, the boundary of the AoI includes the riverbed of Drina and continues east towards Mjeda and along the right bank of river Gjardit continues along the foothills of Mts. Shitit and Pilinardes to village Robosha. Then including the hills above Merqia, the boundary continues south to Lezhe and turns west along the ridge of Mt. Shengjin only to cross the Balidrenit field and then up along the ridge of Mt. Karaoit up to village Ri and excluding the Mertemes floodplain the boundary continues along the foothills of Suka e Dajcit to connect to river Buna again whilst including the Bardaivet and passing the hills above the village Muriqani and Oblika e Madhe where Buna enters Drina. The total area of the AoI is 34702 ha.

The following table describes the project area of influence for construction and operational phase.

Table 7 Project area of influence in construction and operational phase

Components	Construction phase	Operational phase
Air quality	Physical footprint of the project, 500 m left and right from the alignment	Alignment of the motorway with all auxiliary infrastructures, 500 m left and right from the alignment
Noise and vibrations	Physical footprint of the project, 100-200 m left and right from the alignment	Alignment of the motorway with all auxiliary infrastructures, 100–200 m from the alignment
Surface and ground water	Physical footprint of the project, intersected rivers and drainage channels and 500 m left and right from the alignment	Alignment of the motorway with all auxiliary infrastructures, intersected rivers and drainage channels
Geology, erosion and soil	Physical footprint of the project, access roads and disposal areas	Alignment of the motorway with all auxiliary infrastructures
Waste	Physical footprint of the project, 700 m left and 500 m right from the alignment	Alignment of the motorway with all auxiliary infrastructures
Biodiversity	Physical footprint of the project, EAAA for species and habitats	Alignment of the motorway with all auxiliary infrastructures, 2x500 m left and right from the alignment, EAAA for critical habitats
Social	Physical footprint of the project, 500 m left and right from the alignment	Alignment of the motorway with all auxiliary infrastructures

5.1.2 Environmental monitoring

The principal legislation concerning monitoring in Albania is the National Environmental Monitoring Program (NEMP), as promulgated under DCM No.1189, dated 18.11.2009. The main stakeholders concerned with the implementation of NEMP are MoE (Ministry of Environment), MoHSP (Ministry of Health and Social Protection), MoARD (Ministry of Agriculture and Rural development), Ministry of Defence (MoD), and the MoIE.

The stakeholder tasked with the coordination of the monitoring and reporting process of the natural resources components is MoTE through NEA. Hence the NEMP is formulated by NEA and approved by MoTE. Reporting is provided through the publication of the State of Environment Report (SoER), which is prepared and published

every year by NEA, and is a legal obligation stipulated under the Law no.10431, dated 9.6.2011 "On environmental protection" and DCM No.1189, dated 18.11.2009".

Due the lack of capacity to cover their monitoring responsibility, NEA sub-contracts private consultants including Albanian universities, licensed private institutes and laboratories and research centers. The publication of environmental monitoring data, aims to raise public awareness on the state of environment at local and national level. The main monitored indicators cover air quality, noise levels, surface and groundwater quality, soil, coast (beaches), seas, forests, and biological diversity.

5.1.3 Climate Characteristics

The Albania's geographical position along the Adriatic and Ionian Seas defines its predominantly Mediterranean climate, characterized by mild, wet winters and hot, dry summers, with significant regional variability influenced by topography and proximity to the sea. Rainfall occurs mainly during the cooler half of the year (October–March), while summers are typically dry with high evapotranspiration rates.

According to the National Environmental Agency (AKM, 2025), Albania experiences a mean annual air temperature ranging between 7°C in the northern alpine zones (Vermosh, Theth, Valbonë) and 17–18°C in the southern coastal lowlands (Sarandë, Vlorë). Lowland and coastal regions show an average annual temperature of 14–16°C, while mountain areas maintain cooler averages between 6–10°C. The annual temperature amplitude (difference between the warmest and coldest months) ranges from 14°C in coastal areas to 21°C inland, reflecting a strong continental influence in interior basins.

Average annual precipitation at the national level is approximately 1,430 mm, though highly variable across regions. The northern and southwestern mountainous areas (e.g., Boga, Kodra e Shëngjergjit, Nivica) register the highest precipitation values, often exceeding 2,800–3,000 mm per year, whereas the western lowlands receive between 900–1,200 mm. About 70% of total precipitation occurs in the colder half of the year. The wettest months are November and December, while July and August are the driest.

Snowfall is a characteristic feature of Albania's mountainous regions. The average snow depth in alpine areas ranges from 60 to 120 cm, occasionally reaching 2–3 meters in Vermosh, Valbonë, and Lurë, while it is rare in the western plains and coastal areas.

In the Shkodra–Buna–Drin basin, which lies within the project's area of influence, the climate is Mediterranean with local continental influences due to the barrier effect of surrounding mountains. Annual rainfall ranges from 2,000 to 3,200 mm, with relative humidity between 65% and 80%, peaking during the winter months. Average summer evaporation is 180–230 mm, approximately five to six times higher than in winter. Thunderstorms occur on roughly 45–55 days annually, primarily during summer months.

The thermal regime in northwestern Albania is complex, influenced by air mass circulation and proximity to the Adriatic. Average maximum temperatures occur in July–August (up to 39°C), while minimum temperatures are recorded in January (around 0–2°C). The configuration of the mountain ranges directs the southward trend of isotherms, illustrating the gradient of declining temperatures toward the north and interior highlands.

The wetland systems surrounding Lake Shkodra, the Buna River, the Gjadër River, and the Lower Drin floodplains play an important microclimatic role, moderating local temperature extremes, increasing humidity, and supporting flood regulation functions. These ecosystems contribute to maintaining a relatively stable local climate despite the pronounced seasonality of precipitation typical of Mediterranean zones.

5.1.3.1 Temperature projections

Since the 1960s, the annual mean temperature in Albania has increased by 1°C, and there has been a six to eight-fold increase in the intensity, duration and number of heat waves across the eastern Mediterranean. Predictions for the climate in 2050 include further increases in temperature, rising sea levels, and more precipitation falling as intensive rain episodes instead of snow.

Following UNDP (2021), in terms of temperature, all scenarios for the river basins area, including River Buna and surrounding zones, suggest that the area is likely to become warmer. Similarly, increasing trends in annual and seasonal temperatures, both minimum and maximum values, are expected. Temperature extremes are

also expected to increase. The analysis of the precipitation projections shows a negative slight trend for all seasons and time horizons. The analysis indicates a higher risk for intensification of heavy precipitation that causes flooding as well as a likely increase in drought frequency.

All the scenarios reveal a likely increase in annual temperatures related to 1990 for all time horizons (UNDP, 2016).

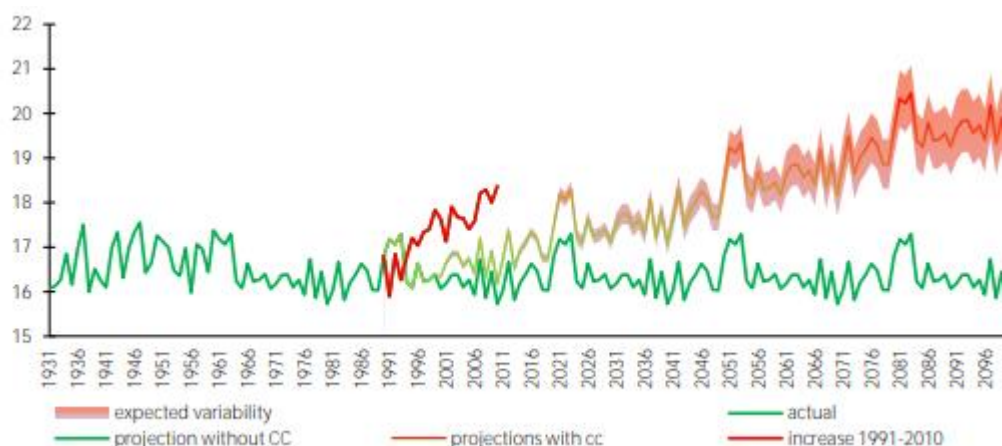


Figure 9 Annual temperature projections (°C) with and without climate change, central part.

The red line shows that observations after the year 2000 reached the values projected for 2020 and the trends is continuously increasing. The colored field shows the high temperature variability (5%, 95% quantiles), indicating the likely drought and heat waves frequency increase (Source: UNDP, 2016)

5.1.3.2 Rainfall projections

In Albania, climate change predictions indicate the intensification of heavy precipitation and an increase in the frequency of heavy rains with longer duration, causing flooding and economic damages (Sutton et al., 2013). There is already evidence of increasing frequency of high intensity rainfall, which is increasing pluvial or flash flooding which inundates the floodplain in a matter of hours. In winter, longer duration rainfall causes flooding which lasts for several weeks during the winter period while long-duration spring rainfall combines with snowmelt to cause flooding. Flood risk is a combination of river flooding and coastal flooding due to sea water inundation (storm surges), both of which are increasing with climate change.

Following projection (UNDP, 2016), the outputs of different scenarios lead to the conclusion that the annual precipitation is likely to decrease up to -8.5% (from 47.4 to -56.0%) by 2050; up to -18.1% (from 94.0 to -89.7%) by 2100 (Figure below).

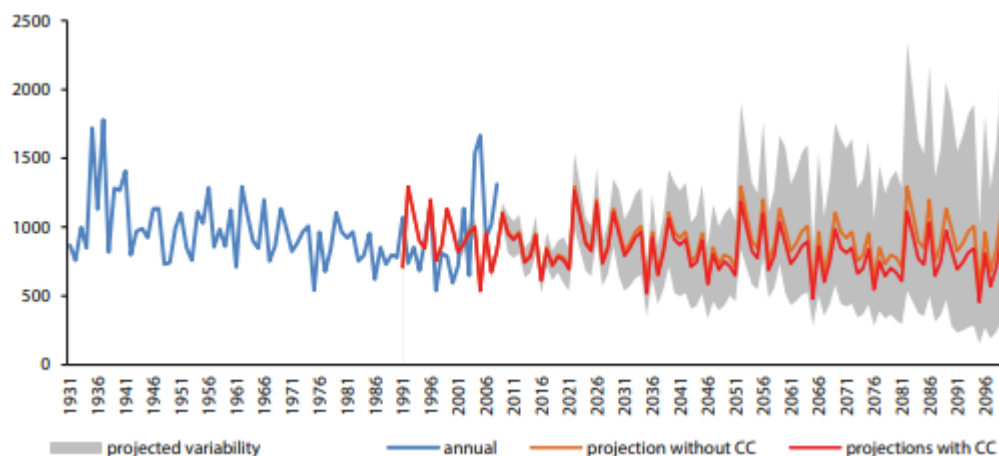


Figure 10 Annual precipitation projections (mm) without and with climate change (average scenario), central part.

The grey field shows the high precipitation variability (5%, 95% quantiles), indicating the likely frequency increase in heavy precipitation and drought cases (Source: UNDP, 2016)

5.1.4 Climate change

Albania is recognized as one of the most climate-vulnerable countries in Southeast Europe, due to a combination of its complex mountainous topography, extensive coastline, hydrological regime, and socio-economic exposure. According to the Notre Dame Global Adaptation Initiative (ND-GAIN) Index (2023), Albania ranks 77th out of 182 countries, indicating high sensitivity and moderate adaptive capacity to climate change impacts.

The country's climate policy framework is guided by its commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. Albania submitted its Updated Nationally Determined Contribution (NDC) in 2023, which reconfirms its objective to reduce greenhouse gas (GHG) emissions by 20.9% by 2030 compared with the baseline scenario, and to pursue a low-carbon and climate-resilient development pathway. These targets are consistent with the broader EU climate alignment agenda under the Energy Community Treaty.

The National Adaptation Plan (NAP) process, initiated in 2015 and formally adopted by the Government in 2019, provides the overarching strategy for integrating climate change adaptation (CCA) into sectoral policies. The NAP update (2023) reinforces resilience objectives across water resources, agriculture, forestry, biodiversity, coastal management, energy, health, and urban development. Implementation of the NAP is coordinated by the Ministry of Environment (MoE) through the National Council for Climate Change and the Inter-Institutional Technical Working Group on Adaptation.

Albania's most recent Greenhouse Gas Inventory (2023) identifies the energy and transport sectors as the largest contributors to national emissions, accounting for approximately 45% of total GHG output, followed by land use, land-use change and forestry (19%), agriculture (16%), industry (12%), and waste (8%). The country's Fourth National Communication (FNC) and First Biennial Transparency Report, under preparation in 2024–2025, aim to provide updated emissions data and detail national adaptation actions consistent with the Paris Agreement's Enhanced Transparency Framework.

Climate-Related Natural Hazards

Albania is highly exposed to hydro-meteorological hazards including floods, droughts, heatwaves, forest fires, and landslides, which are increasingly aggravated by climate change. Floods remain the most frequent and damaging natural hazard, especially in the northwestern river basins (Drin-Buna, Mat, Vjosa, and Seman), where intensive rainfall, upstream deforestation, and sedimentation amplify overflow risks.

Recent AKM monitoring (2025) indicates a growing frequency of flash-flood events, particularly in the Buna–Drin delta, with the combination of heavy precipitation and sea-level rise increasing the likelihood and spatial extent of inundations. Meanwhile, summer droughts have become more persistent, affecting agricultural productivity and water supply reliability in inland areas.

Disaster Risk Management (DRM) and Adaptation Approaches

Albania continues to mainstream Disaster Risk Management (DRM) and Disaster Risk Reduction (DRR) principles into its environmental and spatial planning systems. The Law No. 45/2019 "On Civil Protection" established the National Agency for Civil Protection (NACP), responsible for coordinating risk prevention, preparedness, and response across all levels of governance.

The National Strategy for Disaster Risk Reduction 2020–2030 and its Action Plan promote a proactive, risk-based approach that integrates climate adaptation measures, focusing on:

- Protection of critical infrastructure (bridges, hydropower dams, flood defenses);
- Modernization of early-warning systems and meteorological monitoring;

- Strengthening of local emergency management capacity; and
- Integration of climate and risk data into urban and regional planning.

Current adaptation and DRM measures prioritize resilience of transport corridors, river embankments, and drainage networks—particularly in the Shkodra–Lezhë–Buna floodplain—and are supported through EU, UNDP, and World Bank programs. These measures aim to reduce vulnerability to both riverine and coastal flooding while safeguarding human settlements and economic infrastructure.

5.1.5 Geology

5.1.5.1 Geodiversity

According to geological point of view, projected work route (motorway alignment, i.e. 1,000 metres wide corridor is consisted of 3 geological complexes (from older to younger):

Middle Createous (Cr2) carbonate rock masses (limestones and dolomites), recognized at the end of the route (point 18), where tunnel is predicted. This separated rock mass has an anticline form, with the direction of extension NW-SE. The wings of the anticline fall below 35 degrees (towards NE), i.e. below 42 degrees towards the SW.

Upper Paleogene (Pg13) rock masses (flysch sediments) are registered on the ground on several stop points: southern of point 1 and around Muriqan village, near point 4 (between Berdice and Beltoje villages) and on SE side of the route between point 12 and 13 (between Maba-Shahinaj village – Gramshi (Tushaj) village – Maba (Sumi) village. They are mostly built of layers and inter-layers of clay, marl, claystone, sandstone and calcarenite. This clay-sand flysch package may have rare inter-layers of plate limestone and dolomite. Estimated depth of these sediments reaches 600m. These rock masses are generally the basis of Neogene sedimentary rocks. Mostly water impermeable, except locally, where fracture type of porosity is developed.

Most presented rock masses along projected motorway corridor are Quaternary - Holocene sedimentary rocks (built of gravel, sand, clay, mud and their varieties), wide developed in Buna, Gjadrit and Drini River valleys. This deposit represents almost all genetic types from the continental ones (eluvions, deluvions, colluvia, proluvions, alluviums, glacial, marshy, lake) intermediate (lagoon, delta) and deposits. In many cases there are mixed genetic types such as alluvial-proluvial, alluvial-swampy, proluvial-lake, etc.

Alluvial deposits are most widespread in the fields of Shkodra, Lezhe, where they have received the name alluvial fields. Their thickness varies from several meters to 20-30m, located on the alluvial deposits of the Pleistocene, represented mainly by gravel. These deposits are often mixed with marsh deposits, formed on the both side of the river bed.

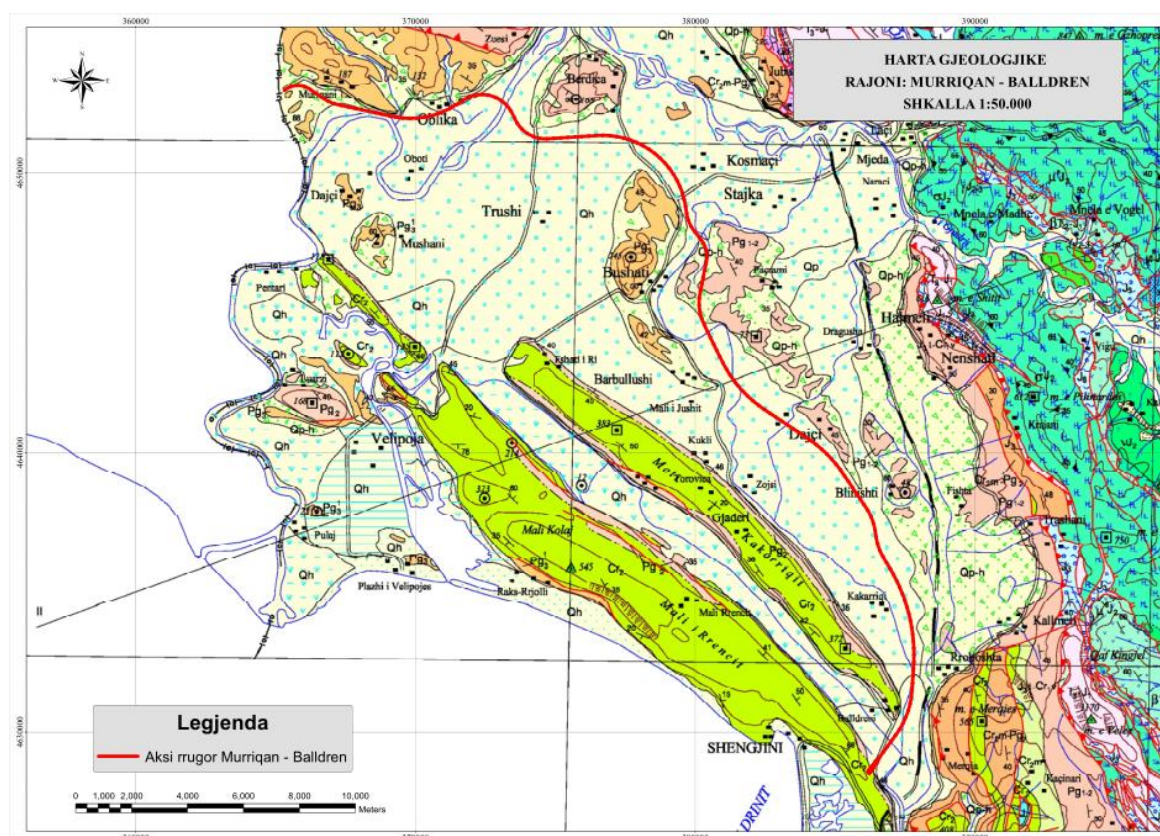


Figure 11: Geologic map of the area of study

5.1.5.2 Geo-hazards

A geologic hazard or geohazard is an adverse geologic condition capable of causing widespread damage or loss of property and life.

Along the projected route due to the large amplitudes of the flows of the nearby rivers, in the whole area where the route of the motorway is projected, periodic floods are frequent and should be expected.

The riskiest flooding area is along the valley of the river Buna, which means that the subject route under the village Muriqan (on the left side of the river), to the village Berdica (on the right side of the river) is our main point of interest, meaning flooding area.

5.1.5.3 Hydro-Geological Terrain Properties

Along the subject route, the appropriately represented geological (lithological) units, 2 structural types of porosity were registered, i.e. rocks with:

Intergranular type of porosity, where confined type of aquifer exist.

Karst i.e. karst-fissured type of porosity, where karst type of aquifer exist

a) The compact type of aquifer is formed in the previously mentioned Quaternary deposits, developed along the valleys of the rivers Buna, Drini and other smaller watercourses and channels. This is the most common type of aquifer along the corridor, with one or more aquifers (in depth), with free groundwater level and with pressure groundwater level (so-called "artesian" aquifer). The groundwater level of the first (uppermost) aquifer generally follows the levels of rivers and other surrounding watercourses and canals.

The aquifer recharge of this aquifer (aquifers) is through atmospheric precipitation, through direct contact with the surrounding watercourses, as well as through lateral contact with the neighboring (mostly karst) aquifers.

Groundwater routes from this aquifer (meaning the highest aquifer) generally follow the fall of the terrain and productive water-bearing horizons (gravel and sand) and subsequent changes in the routes are expected in periods of hydrological maximum and minimum (directions from and to river flows).

The discharge of this aquifer is mainly to the river flows, in the period of hydrological minimum, laterally to the adjacent lower aquifers, through springs and artificially from constructed wells for water supply and irrigation. Along the projected corridor through were registered several hand-made shallow dug wells, used for extraction of groundwater (mostly for irrigation and for feeding animals).

b) Karst i.e. karst-fissured type of aquifer is registered in previously mentioned Createous (Cr2) carbonate rock masses (limestones and dolomites), recognized at the end of the route (point 18). Around 5 km NW of point 18, there is a karst spring for water supplying of Kakariqi village ($Q=1-10$ l/s), but what is and what is more important to note, next to the planned tunnel is registered a karst spring with identical capacity ($Q=1-10$ l/s) and it is captured for water supply in the settlement Baldreni.

Due to the expected high karst porosity of these rock masses and the appearance of significant karst springs (most of which are already engaged in local water supply), special attention should be paid to this site, both in the design phase (geotechnical exploration works) and in the construction phase.

5.1.6 Soil erosion

Soil loss via water erosion in Albania is a widespread phenomenon. Soil loss is 2-3 times higher in Albania than in other Mediterranean countries and 10 to 100 times greater than in many other European countries. The typical Mediterranean climate is one of the most aggressive ones in terms of erosion (heavy rainfall intensities, high rainfall amounts, drought as a permanent phenomenon, etc.). This together with the topographic and soil conditions (steep slopes, silty soils, low humus content) already classifies about more than 50 % of the total area in Albania as naturally erosive. This is amplified by the anthropogenic impacts (forest cutting, cultivated steep slopes, up-down cultivations, bare soils after harvesting, overgrazing, absence of erosion protection measures) resulting in significant soil loss rates. The available reports state a national average soil erosion rate of 27.2 tons per hectare and year, which results in an annual sediment flux of 60 million tons carried by the Albanian watercourses.

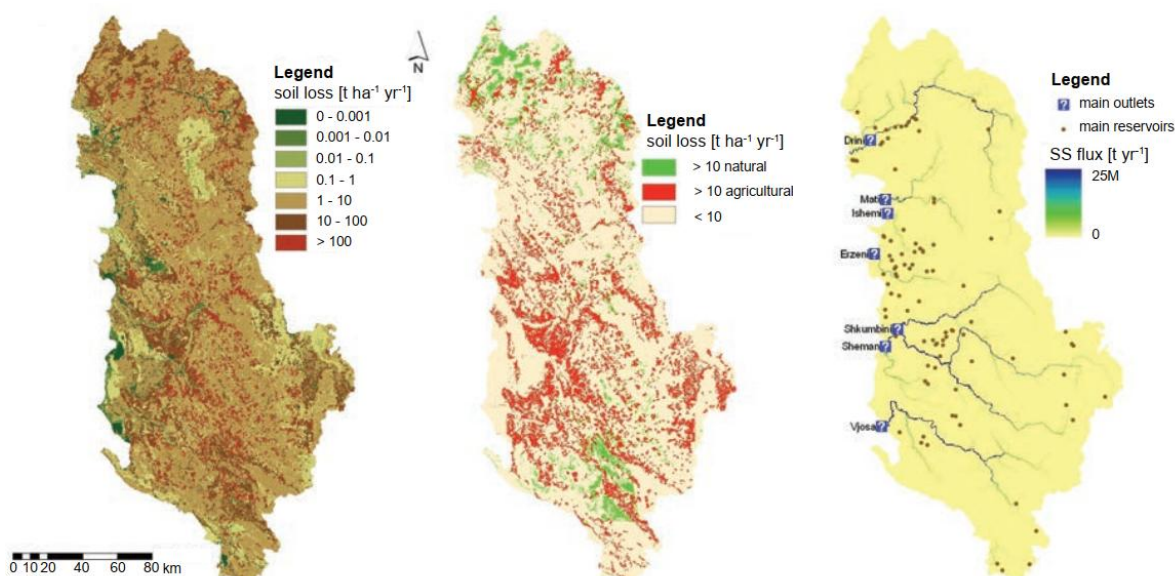


Figure 12 (a) Calculated long-term average specific soil loss rates in Albania; (b) Agricultural and natural source areas of soil erosion in Albania; (c) Sediment transport by the main watercourses of Albania.

The calculated soil loss rates of Albania are shown in the figure below. There is remarkable soil loss in the whole territory, but it is especially significant in three main regions, which are located in the north, in the central part of the country and in the south. In these regions, high soil loss rates can be found with values more than 10 tons per hectare and years, but values even more than 100 tons per hectare and years appear also quite frequently. Countrywide average soil loss rate is 31.5 tons per hectare and year, which is far above the tolerable limit of 10 tons per hectare and years. The average rate means totally 90.5 million tons soil eroded annually in the country.

About 22 % of the country area has higher soil loss rate than the tolerable value (10 tons per hectare and year). This 22 % is responsible for the majority (93 %) of the soil erosion. Main source sector is the agriculture, which generates ca. 90 % of the total soil loss, especially agricultural lands located on high slopes. The main Albanian rivers transport considerable SS loads to the seas, ca. 60 % of the total soil loss amount can reach the coastal zones.

5.1.7 Soils

The Shkodra Lowland, located in the northwestern part of Albania, forms part of the Drin–Buna River Basin and includes extensive alluvial plains and coastal lowland areas. Soils in this region have developed mainly over Quaternary alluvial deposits and are influenced by the Mediterranean climate, characterized by humid winters and dry summers.

Soil Types and Distribution

The dominant soil types in the western coastal zone and floodplain include Fluvisols, Luvisols, Phaeozems, and Vertisols. These soils are highly fertile but subject to periodic flooding and waterlogging, particularly near the Buna and Drin rivers.

- **Fluvisols:**
Typically formed on level topography affected by periodic flooding or high groundwater tables, these soils occur along river floodplains, deltas, and coastal lowlands. They are composed of recent alluvial materials—riverine, lacustrine, or marine in origin—and often display a stratified profile with alternating layers of organic matter and mineral sediments. Their high fertility makes them suitable for intensive agriculture, including cereals, vegetables, and pastures. However, they are vulnerable to erosion, salinization, and contamination from flood events.
- **Luvisols:**
Found across the central and southeastern parts of the basin, particularly on gently sloping terrains with moderate drainage. These are well-developed mineral soils characterized by a clay-enriched subsurface horizon (Bt horizon). They support mixed agricultural use, including orchards and vineyards, but are prone to compaction and reduced permeability if not properly managed.
- **Phaeozems:**
Dark, humus-rich soils with high base saturation, typically associated with grassland and light forest areas. They occur sporadically in higher terraces and old alluvial plains. These soils are moderately fertile and suitable for dryland crops but require careful management to prevent nutrient depletion.
- **Vertisols:**
Heavy-textured clay soils occurring in depressions and low-lying plains. They exhibit strong shrink–swell behavior due to high smectite clay content, leading to cracking during dry periods. Their structure limits infiltration, contributing to seasonal waterlogging and restricted mechanization potential.

Soils in the Central Drin Basin

Along the central and upland areas of the Drini River Basin, soil formation is influenced by limestone and marl bedrock and varying degrees of slope. The predominant soils include Leptosols, Cambisols, and Luvisols:

- **Leptosols:**
Shallow soils (<30 cm) formed on calcareous and hard-rock substrates. They have low water-retention capacity and are classified as weakly developed soils with limited agricultural potential, commonly supporting pasture or shrub vegetation.
- **Cambisols:**
These soils represent transitional stages of soil development, found on moderately sloping terrain. They contain a cambic horizon (Bw) and moderate organic content. Their moderate fertility makes them suitable for mixed cropping and grazing, though prone to erosion under poor land management.

Soil Characteristics and Sensitivities

The Drin–Buna Basin soils are characterized by:

- High organic matter and cation-exchange capacity in alluvial plains;
- Vulnerability to flooding, salinization, and erosion due to fluctuating river regimes;
- Localized contamination risks from agricultural runoff, fertilizers, and wastewater discharges near Shkodër;
- Gradual degradation in areas subject to overgrazing or unregulated sand/gravel extraction.

Soil monitoring is limited, with data collected irregularly under the National Environmental Monitoring Programme (NEMP). Recent assessments (AKM 2024) highlight the need for systematic soil-quality monitoring to track organic carbon levels, heavy-metal content, and erosion rates, particularly in agricultural and flood-prone zones.

Soil quality

For the purpose of this ESIA, a soil quality baseline survey was conducted in 2023 on total of 10 locations along the road alignment with a monitoring scope that included: pH, metals (Mn, Cu, Ni, Pb, Zn, Co, Cr, Cd, As, V, Ti, Fe, P) and hydrocarbons. To obtain a representative sample, which will reflect the chemical nature of a particular area, soil samples for each location are taken from 5 points, at a depth of 10-30 cm. The concentrations of the elements of interest (so-called analytes) in the 10 samples were determined by atomic emission spectrometry with inductively coupled plasma (AES-ISP). The analyzes were performed in accordance with ISO 17025:2018 accredited laboratory UNILAB - UGD Stip, with ICP-MS technique, also in accordance with ISO 11464: 2006.

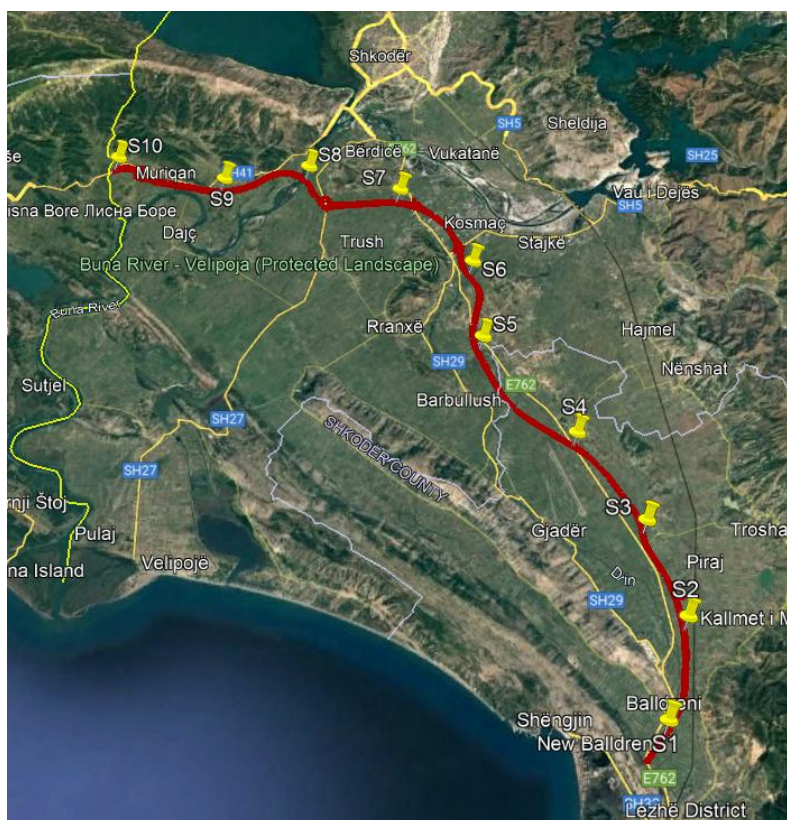


Figure 13: Locations of soil quality monitoring points along the road alignment

The measured values of pH are in the range of 8,16 – 8,53, with an exception for the sample S2 showing a pH=6,61. Because there are no national soil legislation, law, or regulation acts on soil quality, the report compares the detected levels of particular components (heavy and hazardous metals) to the Dutch soil standards (target and intervention values). Based on the results, the target values have been exceeded for 4 metals (Cu, Ni, Cr and Co) on 11, 12, 12, 12 locations, respectively, whereas the intervention values have been exceeded only for 2 metals (Ni and Cr) on 1 (S4 location) and 2 locations (S3, S4), respectively, most likely due to the geology of the terrain and the natural presence of those elements.

Code	Mn	Cu	Ni	Zn	Cr	As	Pb	Co	Cd	V	Ti	Fe	P
	mg/kg												
S1	1325	48,7	104	81,5	284	25,1	22,4	32,8	< 1	148	5437	52453	877
S2	666	37,3	69,1	70,4	185	13,3	32,9	21,1	< 1	124	5216	42550	670
S3	1656	56,7	155	93,6	441	24,9	22,1	53,1	< 1	160	5653	60620	1023
S4	1353	51,7	273	74,6	1183	12,5	17,5	81,0	< 1	157	5053	73084	475
S5	943	43,3	84,5	72,0	282	15,9	24,2	29,3	< 1	130	4423	42430	388
S6	1077	41,7	98,7	65,0	321	19,0	23,6	29,4	< 1	131	5046	46495	780
S7	1310	44,8	96,1	78,1	281	21,3	24,5	31,1	< 1	130	5408	46224	1016
S8	1159	43,4	109	71,3	345	19,9	16,9	30,3	< 1	138	5269	50863	757
S9	1002	39,8	60,6	70,0	238	12,3	48,0	22,7	< 1	88,8	3172	32549	883
S10	842	33,6	48,2	71,2	213	12,1	25,8	18,4	< 1	75,0	2763	25455	801

Table 1: Chemical soil sample analysis

5.1.8 Land use

This section provides an overview of the land cover/land use in the AOI. Additionally, an area of 1,000 metres wide corridor (500 metres on both sides of the construction line), is used for this ESIA scoping phase to present the baseline in wider context, which is considered as representative and sufficient to identify the current land use and structure in the broader area.

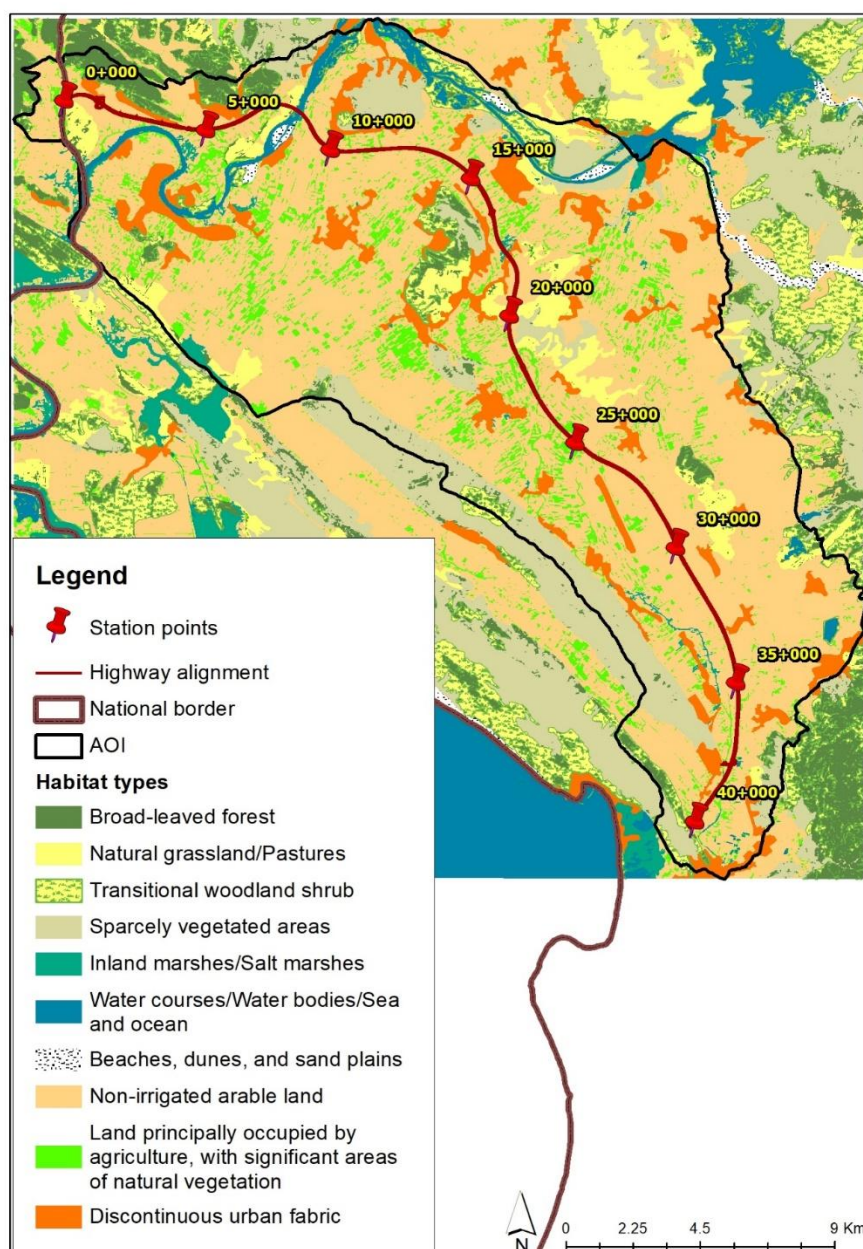


Figure 14 Custom land cover in the AOI, land cover types defined in accordance with CORINE Land Cover

Comparative land cover assessment within the study area of the Project's components is made based on CORINE Land Cover and is presented below. In total, 10 different CORINE land cover.

Non-irrigated agricultural land (CORINE code – 2.1.1) is highly predominant type of land cover, with 19955 ha or 57.5 %. Notable coverage has discontinuous urban fabric (3293 ha), sparsely vegetated areas (3033 ha) and Land principally occupied by agriculture, with significant areas of natural vegetation (3032 ha). Natural grassland/Pastures are represented by percentage slightly higher than 5% while transitional woodland shrub are represented by percentage slightly higher than 4%. All of the other land cover classes are represented with less than 1000 ha (<0.5%).

CORINE Land Cover classes (AOI)	Area [hectares]	Percentage [%]
2.1.1: Non-irrigated arable land	19955	57.5
2.4.3: Land principally occupied by agriculture, with significant areas of natural vegetation	3022	8.7
3.3.1: Beaches, dunes, and sand plains	115	0.3
3.1.1: Broad-leaved forest	980	2.8
3.2.1: Natural grassland/Pastures	1754	5.1
3.2.4: Transitional woodland shrub	1426	4.1
4.2.1: Inland marshes/Salt marshes	333	1.0
1.1.2: Discontinuous urban fabric	3293	9.5
3.3.3: Sparsely vegetated areas	3033	8.7
5.2.3: Water courses/Water bodies/Sea and ocean	788	2.3
Total:	34700.76	100.00

Table 2: Land cover according to CORINE Land Cover types within the AOI of the proposed project

The same CORINE Land Cover types are present in the broader study area with similar proportion of occurrence (see table below).

CORINE Land Cover classes (broader study area of 1,000 metres wide corridor)	Area [hectares]	Percentage [%]
2.1.1: Non-irrigated arable land	5577.0	66.6
2.4.3: Land principally occupied by agriculture, with significant areas of natural vegetation	773.9	9.2
3.3.1: Beaches, dunes, and sand plains	19.7	0.2
3.1.1: Broad-leaved forest	256.7	3.1
3.2.1: Natural grassland/Pastures	379.0	4.5
3.2.4: Transitional woodland shrub	185.7	2.2
4.2.1: Inland marshes/Salt marshes	74.2	0.9
1.1.2: Discontinuous urban fabric	704.0	8.4
3.3.3: Sparsely vegetated areas	302.2	3.6
5.2.3: Water courses/Water bodies/Sea and ocean	103.9	1.2

CORINE Land Cover classes (broader study area of 1,000 metres wide corridor)	Area [hectares]	Percentage [%]
Total:	8376.3	100.0

Table 3 Land cover according to CORINE Land Cover types within the broader study area of 1000 meters wide corridor of the proposed project

5.1.9 Hydrology

For the purposes of the preliminary assessment of the effects on the water environment, the spatial scope includes features of the water environment that are crossed by the highway corridor.

In wider context, from a hydrographical point of view, the highway corridor belongs to the catchment area of the Skadar Lake with Drini and Buna River, which is a part of the Adriatic Sea Basin. (Figure below).



Figure 15: Catchment area of Skadar Lake, with Drin (White and Black Drin) and Buna River

5.1.9.1 Ground water

The Drini-Buna River Basin is characterized by groundwater from three main types of aquifers; Carbonate Magmatic and Quaternary.

Carbonate Aquifers

Carbonate aquifers comprise limestone and dolomites deposits, which occur on the northwest side and in the southern part of the central basin, forming a large mass of carbonate in the so-called Albanian Alps. In these deposits, there are highly productive springs, such as in Tushemishti, Lin (Pogradec), Kalimash, Skavica (Kukes), Valbona, Dunishe (Tropoje), Petroshan and Syri Sheganit. Underground waters originating from carbonate deposition have a large groundwater deficit varying from 100-3000 l/s. The water regime in this

basin aquifer is very changeable in the winter season where flow is substantial and although they are termed springs they are almost rivers.

Magmatic Aquifer

The magmatic aquifer is composed of three types of rocks:

- Aquifer ultrabasic rocks,
- Aquifer of high - acid rock,
- Aquifer of Permian and Lower - Medium Triassic depositions.

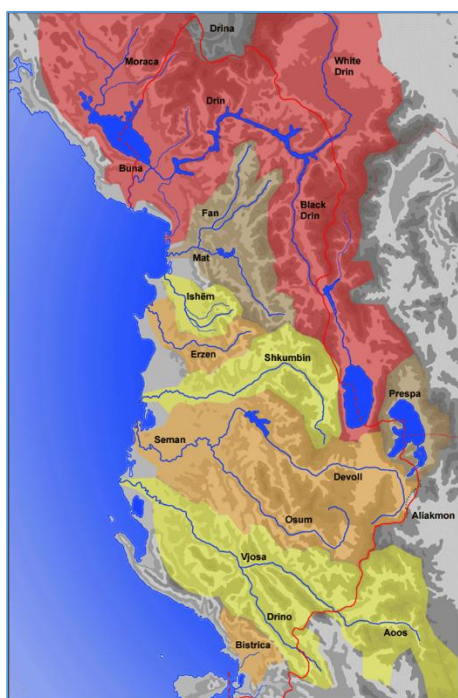
For this aquifer, the only area of interest for groundwater exploitation lies in the massif Krrabi where there are sources with a discharge of 5-25 l/s. The waters classified as fresh waters with a mineralisation of 250-350 mg/l.

Quaternary aquifer

The quaternary aquifer reserves are exploited for drinking water, supplying Kukes, Puke, Tropoja, Malesim e madhe, Shkoder and Lezha and surrounding villages. In the Eastern part of the Drini Basin, the main sources are free discharged water sources from porous calcareous rocks. Exploitation of reserves from the Sub Shkoder field up to 1000 l/sec are evidenced from springs that flows from limestone, which are in dependent of atmospheric precipitation. Deposits of the Shkoder aquifer are observed in the rivers and valleys around Shkoder, Nen Shkoder and Lezha town. Proluvions are encountered in the dry riverbed, where the maximum thickness reaches 6 metres. These are also encountered in the other streams, but in small quantities.

5.1.9.2 Surface water

Shkodra and Lezhe region lies in two river basins Buna and Drini i Lezhes.



River	Max.lenght (km)	Catchment area (km ²)	Average flow (m ³ /s)
Drin	285	14,173	352.0
Buna	41	5,187	320.0
Mat	115	2,441	103.0
Ishëm	74	673	20.9
Erzeni	109	760	18.1
Shkumbini	181	2,441	61.5
Seman	281	5,649	95.7
Vjosa	272	6,706	195.0

Figure 16 Main River Basins in Albania

Drin /Buna Basin are viewed as one unit - The hydrographic catchment of the Drin has a total area of 19,360 km² from which 14,173 km² belong to the Drin itself and 5,187 km² to the Buna River. The Drin is formed by two main tributaries: the Drin i Zi, with a catchment area of 5,885 km², flowing from RONM, and the Drin i Bardhe, from Kosovo. They are sometimes referred to as the White and the Black Drin rivers. The Buna River drains from Lake Shkoder (shared with Montenegro) which is fed by rivers originating from Montenegro and

Albania; its larger tributary is the Morača River in Montenegro. At times of low levels in Lake Shkoder the flows on the Buna River can be reversed.

Buna River

Buna River is composed from of two branches, one is Buna River coming from Lake Shkodra and the other is Drini River. Both branches join after Bahcalleku Bridge.

Lake Shkodra is the largest lake in the Balkan Peninsula in terms of water surface area (between approximately 350 and 530 km²). The lake is a shared waterbody between Albania (about 35 % of the water surface area) and Montenegro (about 65 % of the water surface area). It has a catchment area of about 5,500 km². The biggest inflow contributors into the Lake are the Morača river (MQ of about 200 m³/s, equals 66% of the inflows), followed by the inflows of Malo Blato (about 12 m³/s), of Karuč Bay and River Crnojevića. Several minor additional surface inflows (among others: Rivers Rjoll and Vraka in Albania) are accompanied by high subterranean inflows of roughly 55 m³/s as annual average.

The Buna drains the lake into the Adriatic Sea with a MQ of approximately 340 m³/s at the lake outflow. The Drini River joins the Buna 3.5 km downstream of Lake Shkodra (MQ of 345 m³/s). The total catchment area of the Buna River is about 19,580 km².

The catchment of the Drini River is an international basin that is shared by Albania, Macedonia, Serbia, Kosovo and Montenegro. The catchment area is estimated to be 14,170 km² with a length of 285 km.

The Gjadri and Kiri rivers join to the Drini downstream of Vau I Dejes Hydroelectric power Station and have catchment areas of 200 km² and 264 km² respectively.

Drini i Lezhes River

Drini i Lezhes River is composed of two rivers Drini and Gjadri. Drini i Lezhes River starts from the Shelqet village and ends to Adriatic Sea at Kune Vain Marsh. Gjadri River starts from the Kovac village and joins with the Drini i lezhes at Gjadri village. Both rivers drain the fields in between villages Kovac, Narac, Shelqet, Stajke, Kosmac, Melgushe, Bushat, Rranxe, Barbullush, Torrovice, Kakariq, Hajmel, Krajne, Fishte, Troshan, Kallmet I vogel, Raboshte, Patalej, and at the end Lezha City. Drini i Lezhes river has an area about 220 km².

Section Muriqan - Lezhë of the Adriatic Ionian Corridor, crosses over the drainage and irrigation channels in Obot field, Oblika Stream, Buna River, drainage and irrigation channels of Zhabiak field and Dushkës field, Dushkës drainage channel, irrigation and drainage channels in Ranishta field and Kolagjini field, Kolagjini drainage channel, irrigation and drainage channels in Ashta field, Varishta field, Lumës field, Drini i Lezhës river, Gjadri river branch and irrigation and drainage channels in Gramshi field.

In its first part, it intrudes in Buna river's floodplain and crosses in a transversal direction the river flow. The latest major floods from 2010 and onwards on this area, have resulted in high economic and environmental losses. Without adequate adaptation to the increased flood risk, social, economic and health damage are likely to increase.

Section Muriqan - Lezhë of the Adriatic Ionian Corridor, crosses over the drainage and irrigation channels in Obot field, Oblika Stream, Buna River, drainage and irrigation channels of Zhabiak field and Dushkës field, Dushkës drainage channel, irrigation and drainage channels in Ranishta field and Kolagjini field, Kolagjini drainage channel, irrigation and drainage channels in Ashta field, Varishta field, Lumës field, Drini i Lezhës river, Gjadri river branch and irrigation and drainage channels in Gramshi field.

In its first part, it intrudes in Buna river's floodplain and crosses in a transversal direction the river flow. The latest major floods from 2010 and onwards on this area, have resulted in high economic and environmental losses. Without adequate adaptation to the increased flood risk, social, economic and health damage are likely to increase.

The main affected surface water bodies in the study area are presented in the Table below.

Features of water environment – crossed by and near to the Muriqan-Lezhe corridor

Name of watercourse	Type	Character
Buna	River	Continuous
Drini I Zi	River	Continuous
Drini I Lezhes	River	Continuous
Kirit	River	Continuous
Carines	Stream	Ocassional
Carucit	Stream	Ocassional
Shezes	Stream	Continuous
Lugu i Madhe	Stream	Continuous
Krajnit	Stream	Continuous
Fishtes	Stream	Continuous
Kabashit	Stream	Continuous
Qershise	Stream	Continuous
Grykës së Jushit	Stream	Continuous
Lugu I Pudiganite	Stream	Ocassional
Lugu I Gelaeres	Stream	Ocassional
Lugu I Thaite	Stream	Ocassional
Lugut Tomcit	Stream	Ocassional
Gropës së Fetave	Stream	Ocassional
Lugut të vahut	Stream	Ocassional
Lugut Zenetib	Stream	Ocassional
Bregrykes	Stream	Continuous
Mushanit	Channel	Continuous
Jushit	Channel	Continuous
Kola Gdinit	Channel	Continuous
I Uresse Re	Channel	Continuous
Begsenes	Channel	Continuous
Brinjës së Malit	Channel	Continuous
Drinit	Channel	Continuous
I Zhavorit	Channel	Continuous
Fangulit	Channel	Continuous
Kodhelit	Channel	Continuous
Madh	Channel	Continuous

Table 4: Water bodies (watercourses) crossed by and near to the Muriqan-Lezhe corridor

Following figure depicts the layout of the motorway alignment and its surrounding water environment.

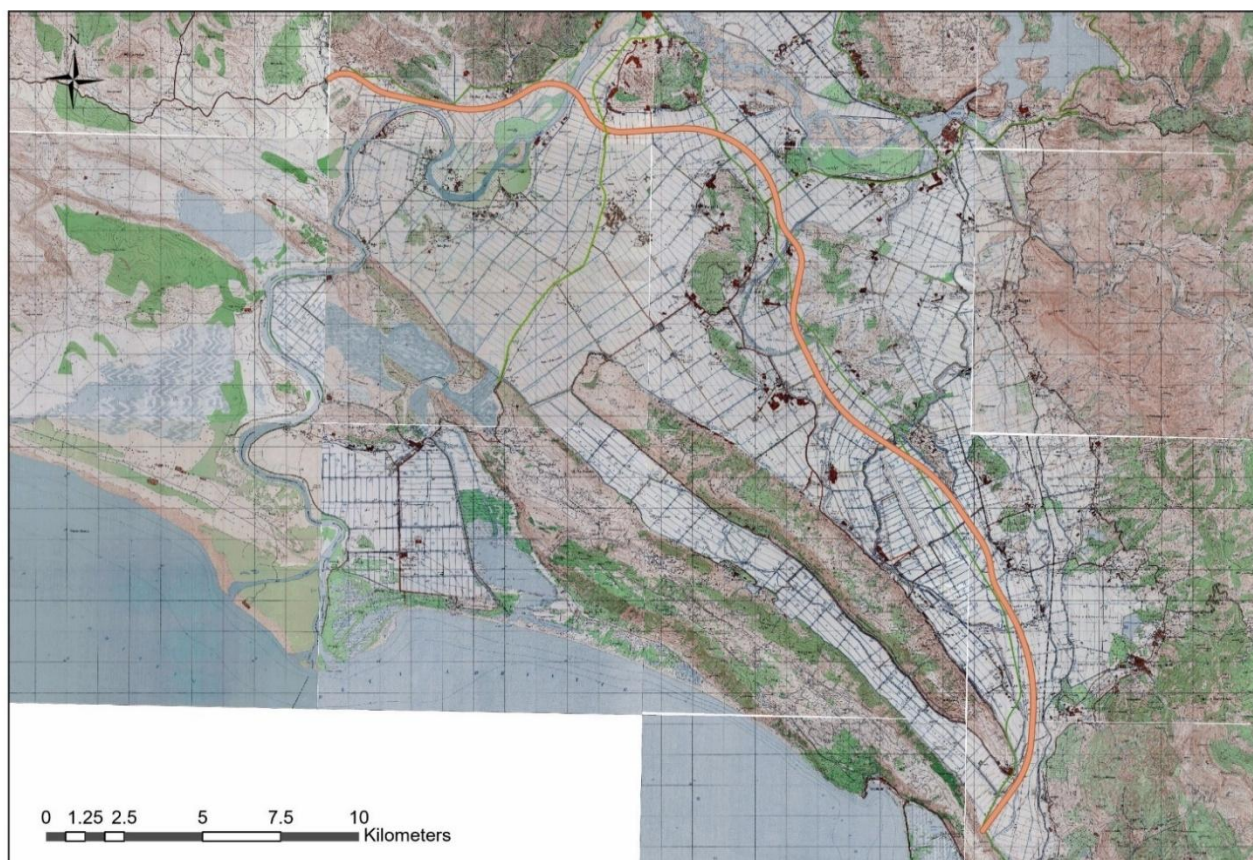


Figure 17: General Layout of the Motorway and the surrounding water environment

5.1.10 Water quality

Based on the National Environmental Monitoring Programme (NEMP), surface and groundwater quality in Albania is monitored four times per year at demarcated stations across inland and coastal waters (rivers, lakes, lagoons, and beaches).

The following tables summarize current monitoring details and results for surface and groundwater as per AKM (2024 State of Environment Report).

Item	Description
Reference to national / international policy	• DCM No. 267, dated 7.5.2014 – Approval of the list of priority substances for the aquatic environment. • DCM No. 246, dated 30.4.2014 – Definition of environmental quality norms for surface waters. • Law No. 111/2012 “On Integrated Water Resources Management.” • Water Framework Directive 2000/60/EC and Directive 2006/44/EC (on the quality of freshwater supporting fish life).
Geographic area coverage	Monitoring network covers six main river basins – Drin-Buna, Mat, Erzen/Ishëm, Shkumbin, Seman, and Vjosa – through 37 river stations, as well as: • Natural lakes (10 stations in Lakes Shkodra, Ohrid, Prespa and Little Prespa). • Lagoon systems (including Butrint, Karavasta and Narta). • Coastal and bathing waters – 14 regular stations in Durrës, Vlorë, Sarandë, Shëngjin and Velipojë, and 10 stations in main ports. In total 108 bathing water points are monitored annually.
Types of monitoring	Continuous physico-chemical, hydrobiological, and microbiological monitoring of surface waters. 23 river inflow stations and 16 TOC/NT stations are operational. The program envisions 151 stations for rivers, 36 for lakes, 33 for lagoons, and 95 for inland waters covering ecological and biological conditions.
Main indicators for monitoring	• Rivers: Temperature, pH, alkalinity, salinity, electrical conductivity, dissolved oxygen (DO), TOC, BOD₅, nitrites, nitrates, ammonia, total phosphorus (P), PO₄, suspended solids. • Lakes/Lagoons: Temperature, transparency, pH, alkalinity, electrical conductivity, DO, TOC, BOD₅, nutrients (N and P), chlorophyll-a. • Coastal waters: Temperature, pH, salinity, electrical conductivity, DO, TOC, BOD₅, nutrients, suspended matter, and microbiological parameters (fecal coliforms, streptococcus).
Responsible authority	National Environmental Agency (NEA / AKM) under the Ministry of Environment.
Frequency and time availability	Four times per year (seasonal sampling – winter, spring, summer, autumn).

Table 5 Surface Water monitoring details

Source: Programi Kombëtar i Monitorimit të Mjedisit 2024–2025 (AKM). (akm.gov.al)

Item	Description
Reference to national / international policy	• Directive 2006/118/EC (on protection of groundwater from pollution and deterioration). • Law No. 111/2012 and related bylaws on integrated water resources management.
Geographic area coverage	Groundwater is monitored in 59 wells and 23 springs across the six major river basins, focusing on carbonate and alluvial aquifers with significant drinking-water importance.
Types of monitoring	Chemical and hydrodynamic monitoring – tracking water table fluctuations and quality changes in representative aquifers.
Main indicators for monitoring	pH, temperature, TOC, dissolved oxygen, nutrients (N, P), chlorides, heavy metals (Fe, Mn, Zn, Pb, Cd), organic compounds, pesticides, PAHs, and microbiological parameters.
Responsible authority	Albanian Geological Survey (SHGJSH) in coordination with the National Environmental Agency.
Frequency and time availability	Twice per year (winter and summer campaigns).

Table 6 Ground Water monitoring details

The Drin–Buna River Basin remains under close observation due to its hydrological importance and exposure to urban pressures.

- Monitoring stations: *Bahçallek* and *Topojan* on the Drin River, and *Ura e Vjetër e Bunës* and *Muriqan* on the Buna River.
- Current quality status (2024):
 - Drin River – classified as good to moderate quality (Class II–III); improved relative to the 2017 baseline.
 - Buna River – moderate quality (Class III) due to nutrient and organic load from urban wastewater discharges originating in Shkodër and adjacent industrial zones.
 - Drin Cascade waters upstream maintain good status (Class II), while the Drin of Lezha sector shows localized degradation from municipal inputs.

Overall, the Drin–Buna basin shows slight improvement compared with 2016–2017, yet still requires enhanced wastewater management and monitoring of nutrient inflows to maintain ecological potential.

Observed Parameters (2024): Temperature, pH, alkalinity, electrical conductivity, dissolved oxygen, BOD₅, COD, nitrates, nitrites, ammonia, phosphorus (total and PO₄), and suspended solids.

Classification Trend: Nationally, surface waters range between Class I (very good) and Class IV (poor); the Drin–Buna system falls in Class III (moderate) for 2024, improving from Class IV in 2016.

Pollution sources: urban wastewater, industrial effluents, and agricultural run-off remain the main pressures in northwestern Albania.

For the purpose of this ESIA, a surface water quality baseline survey (Annex 7) was conducted in 2023 on total of 11 locations along the road alignment, particularly where bridges are foreseen, that included 2 measurement points on Buna River, 4 on Drin River, one on Gjader River and 4 on channels. The monitoring scope covered the following monitoring parameters : pH, Alkalinity, Suspended Solids, Sulphates SO₄²⁻, Chlorides, Phosphorous, Nitrates, Nitrites, BOD, Dissolved Oxygen, Hydrocarbons, Fecal Coliforms, Total Coliforms, Metals including: As, Cu, Bi, B, Fe, K, Ca, Co, Cr, Cd, Mg, Mn, Na, Ni, Pb, Ag, Ti, Tl, Zn.



Figure 18: Locations of surface water quality monitoring points along the road alignment

The aim of the survey is to make an assessment of the ecological status of the water bodies in the area of interest based on the physico-chemical elements. The ecological status is a composite assessment of the quality surface water ecosystems that shows the combined impact of pressures such as pollution, habitat degradation and climate change.

The quality of water samples on all 11 monitoring locations varies from high/good to good/moderate, moderate/poor and bad/poor, whereas three locations (W4, 5 and 7) have bad/poor status for one parameter (nitrates) and one location (W6) has bad/poor status for two parameters (nitrates and dissolved oxygen). This status indicates of organic pollution that is likely to be result of uncontrolled discharge of communal waste waters or runoff coming from agricultural land.

The ecological status for a water body is determined according to the 'one out, all out' principle. This principle implies that a water body can only achieve good status if all biological and supporting quality elements are assessed at least as good. In other words, the quality element with the worst status determines the overall status. Based on this and the results, the status of water quality on 7 out of 11 monitoring locations can be assessed with moderate and the rest of it with poor status (W4,5,6,7).

Monitoring locations	1	2	3	4	5	6	7	8	9	10	11
pH	8.1	8.1	7.8	8.0	8.0	8.1	8.1	8.2	8.5	8.2	8.1
Alkalinity	160	158	142	154	156	159	160	160	163	158	158
Suspended solids	<10	12	<10	<10	15	19.5	93.5	<10	<10	<10	47
Sulphates SO_4^{2-}	25,271	25,8	24,08	26,47	27,37	27,2	30,26	22,2	28,53	43,6	44,1

Chlorides	<1	<1	9,341	5,111	4,025	5,492	9,82	2,098	3,457	38,71	58,71
Phosphorous	0,0139	0,01	0,17	0,043	0,041	0,064	0,065	0,01	0,016	0,089	0,045
Nitrates NO ₃ ⁻	3,183	3,143	1,358	6,397	7,474	7,22	5,872	4,046	5,789	5,2	5,29
Nitrites NO ₂ ⁻	0,0178	0,009	0,008	0,007	0,006	0,01	0,012	0,011	0,015	0,014	0,016
BOD	2.9	3.0	3.3	2.9	3.0	<1	3.3	3.0	3.0	3.2	3.1
Dissolved Oxygen	6.4	6.0	6.1	5.7	6.0	2.9	5.7	5.3	5.6	5.6	6.1
Hydrocarbons	5.5	<1	10.9	5.3	10.8	12.2	22.3	6.9	9.8	21.3	30.3

Table 7: Summary of the surface water quality baseline survey

5.1.11 Air Quality

The air quality in Albania is systematically monitored by the National Environmental Agency (NEA / AKM) under the Ministry of Environment, in cooperation with the Institute of Public Health (ISHP). NEA is the lead institution responsible for national-level data collection, analysis, and annual reporting on air-quality indicators, in accordance with the Law No. 162/2014 "On Protection of Air Quality", the Air Quality Management Decision (DCM No. 352/2015), and the EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

The assessment of urban air quality is conducted using reference methods harmonized with World Health Organization (WHO) Guidelines (2021) and EU limit and target values for key pollutants.

Monitoring Network and Coverage

As of 2024, Albania operates nine fixed air-quality monitoring stations across the main urban centers, supported by additional mobile stations and passive samplers in selected industrial areas. The monitoring network provides data on sulphur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), carbon monoxide (CO), particulate matter (PM₁₀ / PM_{2.5}) and volatile organic compounds (VOCs – BTEX).

The network coverage remains limited, with most continuous automatic monitoring located in large urban centers. The project area (Shkodër region) is represented by one active monitoring station located in Shkodër City, which measures NO₂ and O₃ concentrations.

No.	Location	Scope of Monitoring
1	Tirana	PM ₁₀ / PM _{2.5} , SO ₂ , NO ₂ , O ₃ , CO, BTEX
2	Durrës	PM ₁₀ / PM _{2.5} , SO ₂ , NO ₂ , O ₃ , CO, BTEX
3	Shkodër	NO ₂ , O ₃
4	Elbasan	PM ₁₀ , SO ₂ , NO ₂ , O ₃
5	Korçë	PM ₁₀ / PM _{2.5} , O ₃ , CO
6	Vlorë	PM ₁₀ , SO ₂ , NO ₂
7	Fier	PM ₁₀ , NO ₂
8	Lezhë	PM ₁₀ , NO ₂
9	Kukës	PM ₁₀ , NO ₂



Table 8 National air quality monitoring stations (NEA, 2024) **Figure 19** Locations of air quality monitoring stations in Albania

According to the 2024 State of Environment Report (AKM), air-quality trends in Albania show:

- Exceedances of PM₁₀ and PM_{2.5} remain the main concern, particularly in Tirana, Durrës, and Elbasan, largely due to traffic emissions, residential heating, and construction dust.
- NO₂ concentrations in major cities remain below EU limit values but above WHO 2021 guideline levels during winter peaks.
- O₃ concentrations occasionally exceed EU target levels in summer months, especially in coastal and northern areas (Shkodër and Lezhë), influenced by photochemical smog episodes.
- SO₂ and CO concentrations remain well below both EU and WHO limits nationwide.
- BTEX compounds (benzene, toluene, ethylbenzene, xylene) are recorded mainly near heavy-traffic corridors in Tirana and Durrës, with concentrations declining compared to 2022.

The air quality in Shkodër, the project area, is classified as “good” to “moderate”, with measured NO₂ and O₃ levels consistently within national thresholds.

For the purpose of the previous ESIA, an ambient air quality baseline survey was conducted in 2023 on total of 7 locations (settlements) along the road alignment with a monitoring scope that included Particulate Matter (PM₁₀) and NO₂ concentrations.

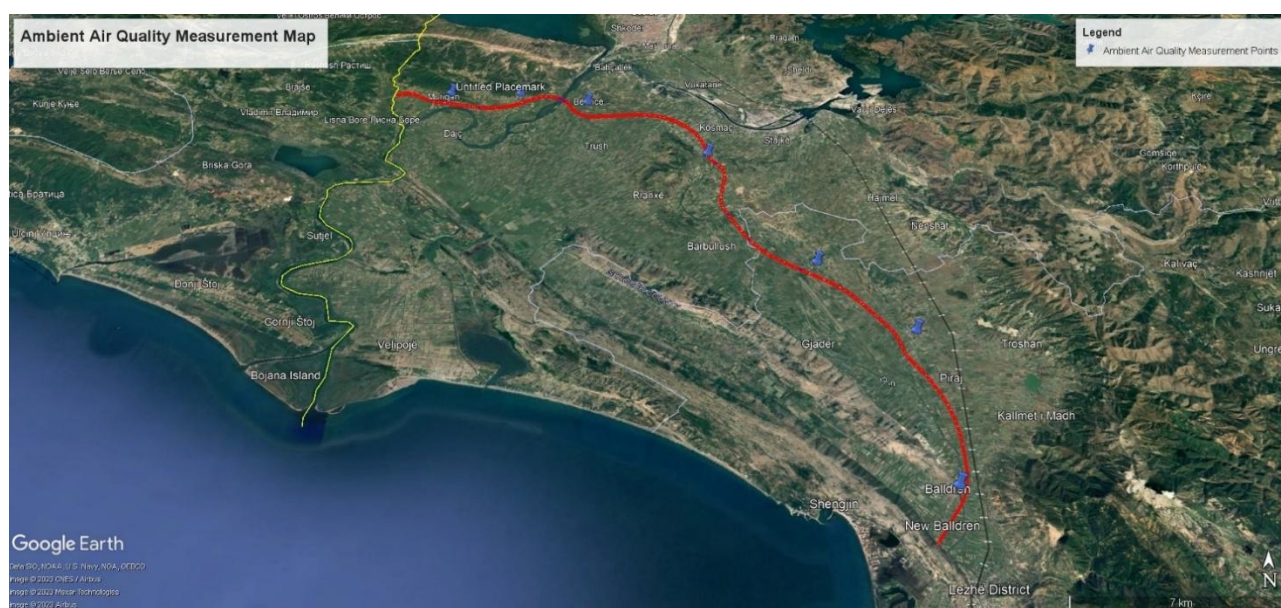
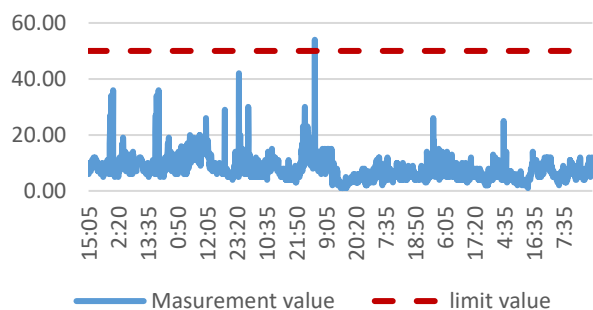


Figure 20: Locations of air quality monitoring points along the road alignment

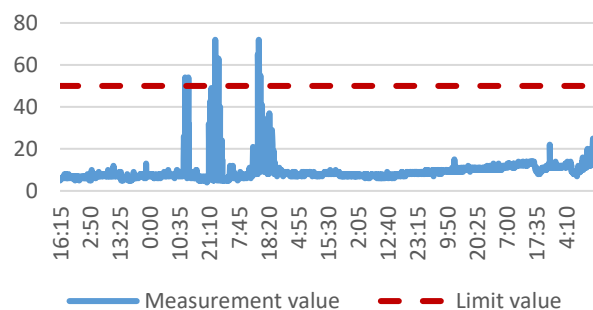
Ambient air quality data collected during April 2023, clearly indicate that ambient air quality reflect rural character of the area and concentrations of all pollutants measured were within limits prescribed in European Directive 2008/50/EC regulations, with occasional exceedings.

Following is a summary on the air quality measured at each sample site, based on a week-long continual measurement of PM₁₀ (no NO₂ concentration were detected on all measurement points – below the limit detection 0.1 ppm).

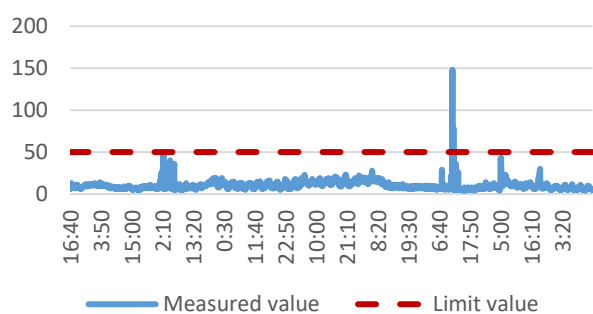
MP1 - Baldreni



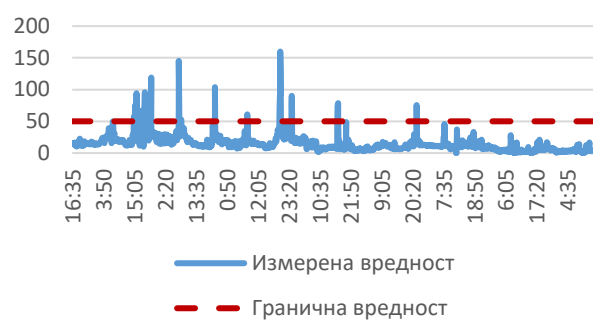
MP2 - Blinisht



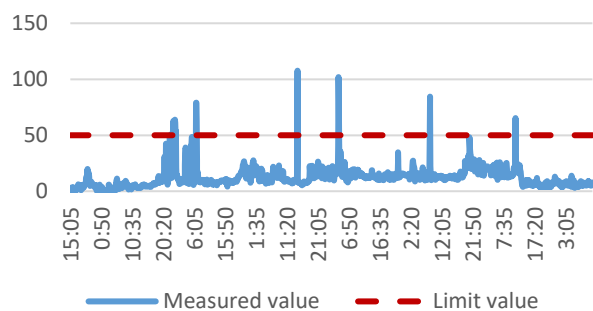
MP3 - Dajc



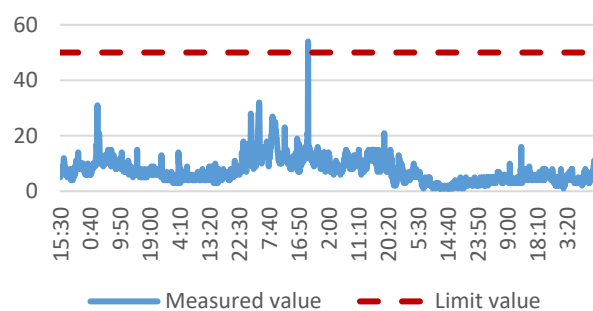
MP4 - Plezhe



MP5-AC - Nasmalaj



MP6-AC - Oblike



MP7-AC - Muriqan

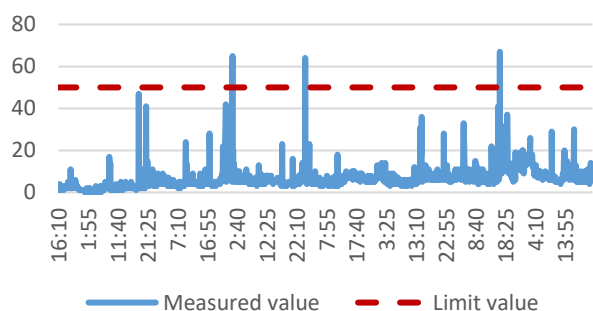


Figure 21 Air quality measurement results graphs for all 7 locations

5.1.12 Noise and vibrations

Noise pollution monitoring in Albania is performed under the coordination of the National Environmental Agency (NEA/AKM) and the Agjencia e Informacionit Mjedisor (AIO), in cooperation with local municipalities. The legal basis for noise control derives from:

- Law No. 10431, dated 9.6.2011, "On Environmental Protection,"
- DCM No. 587, dated 7.9.2016, "On the approval of environmental noise indicators and limit values," and
- Directive 2002/49/EC on the assessment and management of environmental noise.

Monitoring and Coverage

There is limited systematic noise monitoring within the project area, with available data primarily from the city of Shkodër. Background noise levels correspond to those typically observed in mixed urban–residential settings, influenced by traffic, construction activities, and commercial zones. Municipal environmental plans target compliance with EU reference noise limits of:

- **55 dB(A)** for daytime (07:00 – 22:00), and
- **45 dB(A)** for nighttime (22:00 – 07:00).

If traffic growth and construction continue without mitigation, these standards are unlikely to be achieved in the medium term.

Noise Monitoring Results (Shkodër City)

Two automatic monitoring stations are operational under AIO:

Monitoring Station	Daytime Level	Exceedance of Norm	Nighttime Level	Exceedance of Norm
Entrance Junction Station	64.2 dB(A)	+16.7 % (> 55 dB(A))	55.8 dB(A)	+24 % (> 45 dB(A))
University Station	62.1 dB(A)	+13 % (> 55 dB(A))	51.7 dB(A)	+15 % (> 45 dB(A))

Table 9 Ambient noise monitoring results for day and night, Shkodër City (AIO 2024).

The results indicate that daytime and nighttime norms are exceeded at both stations, with higher deviations at the Entrance Junction Station, mainly attributed to heavy traffic inflow on the national road and limited urban greenery for sound absorption.

National Overview

Average daytime noise levels across major monitored cities (Tirana, Durrës, Elbasan, Shkodër, Korçë, Vlorë, Fier) range from 60 to 70 dB(A), while nighttime levels vary between 50 and 58 dB(A). Tirana records the highest levels due to dense vehicular traffic, followed by Shkodër and Durrës.

City	Day Avg [dB(A)]	Night Avg [dB(A)]	Status vs Limit
Tirana	69	57	Exceeds both limits
Durrës	66	54	Exceeds both limits

Elbasan	63	52	Exceeds both limits
Shkodër	63	54	Exceeds both limits
Korçë	61	50	Slight exceedance
Vlorë	62	51	Slight exceedance
Fier	64	52	Exceeds both limits

Table 10 Average noise levels of monitored Albanian cities (NEA/AIO 2024).

For the purpose of the previous ESIA, an ambient noise baseline survey⁵ was conducted in 2023 on total of 11 locations along the road alignment in the vicinity of 11 different settlements (Balldreni, Raboshta, Piraj, Blinisht, Mabe, Shkjeze, Plezhe, Masmalaj, Oblike, Muriqan and Dodaj). The noise measurements were done in the period from 16.02.2023 to 17.02.2023 and 10.04.2023 to 11.04.2023, in accordance with ISO 1996-2:2017 at locations representative of the identified noise-sensitive receptors, as short-term measurements in 1/3 octave band (4 series of 15-minutes measurements during the day, evening and night-time). Measurements are performed at a height of 1,5 m nearby noise-sensitive receptors and on most exposed façade of buildings at a distance of 3,5 m from buildings' walls and other reflective surfaces. For all measurement points software correction of data on equivalent height of 4 m was performed.



Figure 22: Locations of ambient noise monitoring points along the road alignment

The measurements on background noise levels on 11 measurement points in Balldreni, Raboshta, Piraj, Blinisht, Mabe, Shkjeze, Plezhe, Masmalaj, Oblike, Muriqan and Dodaj along the Adriatic-Ionian Road Corridor in Albania and Montenegro, Murriqan-Lezhe section indicate that:

- On measurement points MP1, MP2, MP3, MP8 and MP9, indicators for noise disturbance during the day and evening (Ld, Le) are within limit values according to Albanian Environmental noise protection laws and regulations, based on Instruction No. 8 (27.11.2007) on "Noise levels in different media" and indicator for noise disturbance during the night (Ln) is within limit value according to WHO Guidelines.
- On measurement points MP4, MP5, MP6 and MP7 an exceeding on Indicator for noise disturbance during the night (Ln) according to WHO Guidelines is registered, while indicators for noise disturbance during the day and evening (Ld, Le) are within limit values according to Albanian

⁵ Noise baseline survey report, May 2023, Faculty of Natural and Technical Sciences AMBICON Lab, Environmental and Workplace Department

Environmental noise protection laws and regulations, based on Instruction No. 8 (27.11.2007) on "Noise levels in different media".

- On measurement points MP10 and MP11 an exceeding on Indicators for noise disturbance during the day and evening (L_d , L_e) according to Albanian Environmental noise protection laws and regulations, based on Instruction No. 8 (27.11.2007) on "Noise levels in different media" is registered, while indicator for noise disturbance during the night (L_n) are within limit values according to WHO Guidelines.



Figure 23: Graphical presentation of measurement results for measurement points 2 and 3 (for more info, see the survey report in Annex 8)

			Measurement point										
			1	2	3	4	5	6	7	8	9	10	11
Indicator	MU*	LV*	CV*										
Leq,24h	[dB(A)]		43,6	40,0	39,6	45,7	48,0	44,9	48,6	46,4	45,2	55,7	56,1
Lden	[dB(A)]	53	51,2	48,2	48,4	53,9	58,5	56,2	57,9	51,6	49,8	59,9	60,3
Indicator	MU	LV*	MV*	MV	MV	MV	MV	MV	MV	MV	MV	MV	MV
Ld	[dB(A)]	55	47,7	44,8	42,6	43,1	44,8	43,9	50,6	50,5	50,1	60,4	60,2
Le	[dB(A)]	55	44,6	37,8	40,4	50,4	49,5	40,5	49,5	49,8	47,8	58,7	59,5
Ln	[dB(A)]	45	44,2	41,5	42,1	47,3	52,9	50,8	51,9	40,5	35,9	40,9	43,8

			Measurement point										
			1	2	3	4	5	6	7	8	9	10	11
Indicator	MU*	LV*	CV*										
L _{1.0}	[dB(A)]		49,4	46,8	48,3	60,1	61,1	49,2	58,6	65,1	56,9	68,3	72,8
L _{5.0}	[dB(A)]		47,5	45,1	46,6	52,6	53,5	47,6	56,5	54,3	53,7	64,8	67,8
L _{10.0}	[dB(A)]		46,7	44,0	45,4	42,4	51,1	45,8	55,1	49,0	49,1	62,2	62,8
L _{50.0}	[dB(A)]		43,3	40,6	40,9	38,3	45,6	43,5	49,6	38,0	41,5	46,8	46,2
L _{90.0}	[dB(A)]		39,5	37,7	36,1	35,9	40,7	41,5	48,6	32,5	36,9	33,9	37,3

*MU= Measurement unit; CV= Calculated value; MV= Measured value; LV= Limit value

Table 11: Summary of ambient noise measurement results

Vibration Monitoring

At present, no institution is legally mandated to conduct continuous vibration monitoring related to traffic, rail, or industrial activities. Consequently, no official data are available on vibration intensity or propagation within the project corridor. Vibration assessments are typically undertaken on a project-by-project basis by licensed environmental experts or contractors during environmental impact studies or construction-phase monitoring. The Shkodër region exhibits elevated ambient noise, with exceedances of both day and night standards near major intersections. Expansion of continuous monitoring, enforcement of urban noise maps, and inclusion of vibration assessment in infrastructure planning remain essential to align Albania's practice with the EU Noise Directive 2002/49/EC and the WHO Environmental Noise Guidelines (2018).

5.1.13 Landscape character

The alignment corridor falls within an area dominated by anthropogenic and semi-natural ecosystems (natural ecosystems, but under more or less strong anthropogenic influence, rather degraded at some sections). The landscape can be characterised as Flatland agricultural riverine landscape. The relief is presented by the vast floodplain of rivers Buna and Drini. The floodplain is interspaced with somewhat rolling with mild slopes and dales and patches of remnant natural vegetation. The landscape composition is determined by the dominant participation of the land cover class Non-irrigated arable land that shapes the matrix. The matrix is largely represented by large areas under arable land - fields and croplands with cereal crops and managed meadows. The matrix of agricultural lands hosts high number of villages of compact type. The main economic activities within this cultural landscape are agricultural, fishing, tourism and trade sectors which employ most of the region's population. The tourism sprawl that is particularly notable along the Adriatic coastline boost opportunities for growth in the fishing and retail sectors. Most villagers rely on the highly fertile and productive land to meet their daily subsistence needs.



Figure 24 Flatland agricultural riverine landscape (photo taken from Oblikë, 24.10.2025)

Patches of natural vegetation are mostly sparse and represented by small plots of anthropogenic tree stands, minor remains of forests, xerothermic shrubs and grasslands. Presence of patches of small or larger inland and salty marshy areas is noteworthy. Generally, agricultural landscape types don't have significant contribution to wild species conservation. However, marshes and wetland remnants along the rivers Buna and Drini are significant component of this landscape from biodiversity point of view, particularly important for their role as a habitat, feeding and resting place for the resident and migrating avian fauna. The wetlands along the river Buna and Drini are also noted for their importance for preservation of rare plants.

Hence, as significant part of the Flatland agricultural riverine landscape is designated as IUCN category V – Protected Landscape of the Buna River – Velipoja. The area is also recognised as an Important Bird Area (IBA) further recognized as a wetland of international importance by designation under the Ramsar Convention, Key Biodiversity Area (KBA) of Lake Shkoder - Buna River - Velipoja - Vau i Dejes, Candidate Emerald Site of Protected Landscape of Buna River - Velipoja and Important Plant Area (IPA).

The Buna River – Velipoja Protected Landscape extends along the estuary of Drini, the lagoon of Viluni, the river of Buna with its estuary, and the gulf of Drin that runs across the city of Velipojë alongside the Adriatic Sea, along the border with Montenegro. Like other Mediterranean wetland areas, the floodplain of Buna River has been subjected to strong hydro morphological alterations and much of the inner land was converted into agricultural land. Despite these changes the Buna River area still hosts a great diversity of important habitats and species, most associated to brackish and halophilous vegetation, freshwater aquatic vegetation, swamp vegetation of fresh and brackish waters dominated by graminoids and sedges, grasslands, xerothermophilous forests and scrubs of eastern sub-Mediterranean regions and riparian floodplain and forests (Faneli et al 2015, Schneider-Jacoby et al. 2006). However, within the area of interest these habitats are dispersed within the dominant matrix of agricultural land, have small coverage and are hence not representative.

The Velipolja IBA site includes the sand-dunes, beaches and small brackish pools are found along river Buna and its delta, and the coastal area of Viluni (or Velipoja lagoon). The Viluni lagoon is a large, shallow coastal lagoon at the feet of a rocky and forested mountain area (Bregulbunes mountains). The surrounding marshes and the Dumi wetland are drained by a channel. However, drainage, poaching, hunting and disturbance to birds remain as the main threats for the preservation of the bird species, of which the most important is the Pigmy cormorant – *Phalacrocorax pygmeus* (Heath et al. 2000).

Ramsar site of Lake Shkoder and River Buna: The site hosts up to 25,000 wintering water birds such as Coots (*Fulica atra*), Pigmy Cormorants, different species of herons, ducks, gulls and etc. Drini River waters downstream the ViD HPP is important for breeding water birds while it is visited by wintering, migrating and breeding water birds in search for food. It is known that water birds move from one wetland area to the other

during different stages of their biological cycle including wintering, migrating and breeding. Nevertheless, the data collected so far does not bring evidences of large presence of water birds in the area.

Emerald Site AL0000021⁶ of Protected Landscape of Buna River – Velipoja has the same boundaries as the IBA of Velipoja, which is 1.8 km from the ViD HPP dam following the Drini riverbed. This site serves as a habitat for various species listed under Resolution 6 of the Bern Convention. Notably, it supports bird species such as the Levant Sparrowhawk (*Accipiter brevipes*), Kingfisher (*Alcedo atthis*), Golden Eagle (*Aquila chrysaetos*), and Purple Heron (*Ardea purpurea*). The area's varied ecosystems provide essential breeding, feeding, and migratory habitats, contributing to the ecological integrity of the region. Similar to Velipoja IBA, the project will not cause adverse effects in the Emerald site and its biodiversity.

The KBA of Lake Shkoder – Buna River – Velipoja – Vau i Dejes is bordered by HPP dam. It encompasses a variety of habitats, including freshwater lakes, rivers, wetlands, and coastal zones⁷. This area supports a rich diversity of species, some of which are of global conservation concern such as Adriatic Sturgeon (*Acipenser naccarii*), Albanian Water Frog (*Pelophylax shqipericus*), Pygmy Cormorant, Dalmatian Pelican etc. It serves as an important site for migratory birds, providing essential breeding and feeding grounds. It is believed that the potential impacts of the proposed HPP rehabilitation will not be significant.

5.1.14 Ecological Resources and Biodiversity

Part of the description of the natural environment are the protected areas and, in this case, especially the Buna river-Velipoja protected landscape. Significant part of this particular protected area should be naturally included in the zone of the Adriatic coast and associated geomorphology, landscapes and habitats (coastal habitats, saline communities, lagoons, etc.). Only northern part of the Buna river-Velipoja protected landscape may be under direct or indirect influence by the construction and operation of the Murriqan-Lezhe motorway.

5.1.14.1 Methodology for biodiversity

The baseline for biodiversity was established based on literature data and extensive fieldwork research carried out in the course of the scoping period of this assessment, in September and October 2025, but also previous research in 2022 and 2023. The baseline survey was especially focused on habitats and flora and birds as well as aquatic fauna. Data on aquatic fauna are a result of the field work conducted during September - October, but also some previous research in the area was used (e.g. survey from July 2019 in the Skadar Lake basin). However, data on other biodiversity groups (amphibians, reptiles, mammals) were also collected during the field work (table below).

Habitats were identified during the field surveys based on the existing plant associations, dominant (edifier) plant species, preservation status and composition of plant species in all layer of the habitat (trees, shrubs and herbs layers). All of these data were recorded with OruxMaps free software for Android (<https://www.oruxmaps.com/cs/en/>). The records of individual species (plants, animals) were recorded with Memento Database for Android (<https://mementodatabase.com/>). These ground truth data were used for elaboration of a habitat map within the Area of Interest. Use of hand nets, seine nets and electrofishing was applied during collecting material for both fish and aquatic invertebrates. The following map present the field work carried out in the previous period.

⁶ <https://natura2000.eea.europa.eu/Emerald/SDF.aspx?site=AL0000021>

⁷ <https://www.keybiodiversityareas.org/site/factsheet/46567>

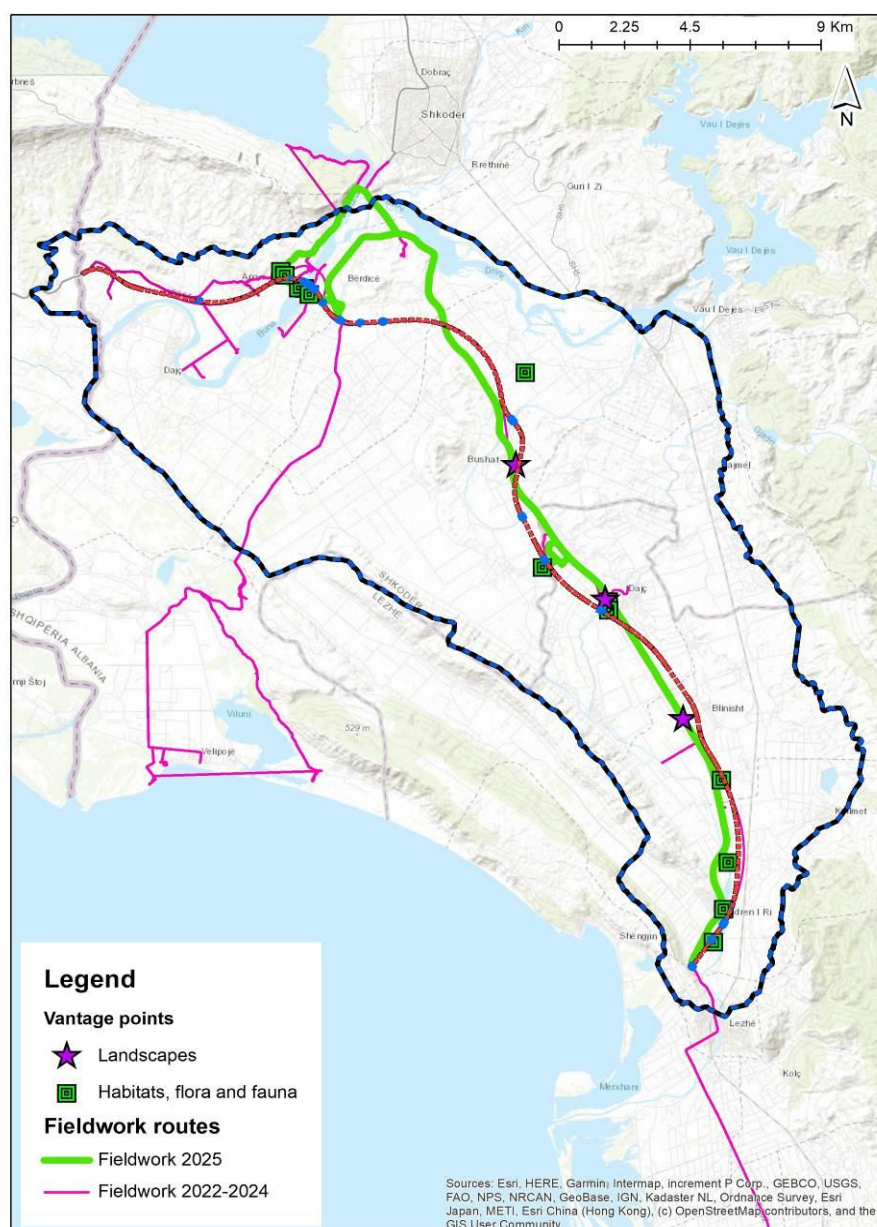


Figure 25 Field work conducted during 2025 with vantage points

Table 12 Overview of the conducted fieldwork during the Scoping phase

Biodiversity components targeted during the fieldwork	Date	Area
Habitats, ornithofauna, aquatic fauna	24.10.2025	Murriqan-Buna
Habitats, ornithofauna, aquatic fauna	23.10.2025	Buna-Lezhe
Aquatic fauna	22.09.2025; 23.10.2025	River Gjader
Aquatic fauna	22.09.2025; 23.10.2025	River Buna
Aquatic fauna	23.09.2025; 24.10.2025	River Drini

5.1.14.2 Habitats

Habitats were identified during the field work based on the present plant associations and other feature of land (dominant species) and aquatic ecosystems (standing, running), dominant species, preservation status and composition of plant species in all observed locations. The natural vegetation includes aquatic habitats as well as some riparian woodland. Significant part of the area along the road footprint corridor is consisted of agricultural habitats, urban and suburban habitats of low biodiversity value. The strong influence of the Mediterranean Sea (Sub-Mediterranean impact) caused the dominant presence of Mediterranean-Sub- Adriatic floral elements and plant communities. On the other hand, Eu-Mediterranean impact is reflected in the presence of most of the typical Eu-Mediterranean floral elements of temperate evergreen forests (*Quercus ilex*, *Laurus nobilis*, *Pistacia lentiscus*, *Olea europaea* and *Arbutus unedo*) in the vascular flora of the Lake Skadar area (Hadžiablahović 2018). Some of these species are not present only as individual specimens, but in certain parts of the lake basin they form typical Eu-Mediterranean plant communities.

In general, dominant habitats (according to the surface) are agricultural habitats (arable and abandoned) including the hay meadows which were scattered in the agricultural matrix. Some of the hills surrounding the immediate vicinity of the alignment were covered with olive grooves. Natural communities occupy much smaller surfaces: small woodlands and hedges of White willows and White poplar in the agricultural land or along the rivers as well as thermophilic forests of Pubescent oak (*Quercus pubescens*) and Oriental hornbeam (*Carpinus orientalis*) and other Mediterranean species (*Carpinion orientalis*). Small stand of *Pinus halepensis* forests was recorded at the end of the alignment (entrance of the tunnel towards Shengjin). Natural communities are also severely altered by people and resemble seminatural communities as well.

Forests and shrublands. Dry oak forests together with shrublands and dry grassland communities, are restricted to the limestone hill outcrops. Three of the identified constituent habitats (two shrubland communities and one dry oak forest type) are listed in the Natura 2000 European network as being priority areas for conservation purposes. These hilly area forms an important grazing areas for livestock and which, together with fire, and soil erosion, comprise key ecological factors concerning the maintenance of these habitats. These hilly areas also support *Salvia officinalis* which is harvested for commercial purposes. Nevertheless, the proposed alignment does not cross any of the oak forest patches. The end of the alignment is characterized by a presence of Aleppo pine stand.



Figure 26 Aleppo pine stand near New Balldren (24.10.2025)



Figure 27 Dry (thermophilous) oak forest near Balldren (24.10.2025)

Alluvial forests and riverine forests. The hygrophilous forests, which occur along the aquatic environments in association with the Buna River and lagoons, are particularly rich in endemic species (such as *Quercus robur subsp. scutariensis*), and include specific habitats listed in the Natura 2000 European network as being priority areas for conservation purposes. The alluvial and riverine forests provide habitat for a number of important terrestrial and avian animals; these forests also provide important regulatory services in the form of protection from wind, protection from soil erosion and control of water flows. The Velipojë forest comprises a key conservation area and is included within the strictly protected core conservation area of the BRPL; it has been fenced in order to protect it from excessive levels of use by visitors. The riparian belt along river Buna is well preserved and represented of Willow (*Salicetum albae-fragilis*) and Poplar (*Populetum albae-nigrae*) communities with fragments of riverine ash (*Fraxinus angustifolia*). At some places the riparian belt is interrupted due to the presence and activities of sand-extraction facilities. However, the riparian belts along rivers Drini and Gjader at the proximity of the motorway alignment are severely degraded and instead of natural riparian woodlands they are represented by alien species (e.g. *Robinia*, *Arundo*, *Amorpha*, *Populus X hybrida*).



Figure 28 Hybrid Poplar riparian belt along channel of river Drini (23.10.2025)

Sand dunes. Sand dunes are restricted to a narrow strip along the coast. The three habitats identified are all listed in the Natura 2000 European network as being priority areas for conservation purposes. Apart from having a restricted distribution, sand dune communities are highly threatened by high levels of use by tourists (beach tourism, cleaning operations and trampling), and also by on-going coastal erosion. Such habitats are not present in the vicinity of the projected motorway.



Figure 29 Sand dunes near Velipoja (07.04.2022)

Wetlands. The area of Velipoja covers one of the largest and most important wetland systems in Albania. It includes a great variety of wetland habitats, ranging from flowing to still, permanent to seasonal water bodies of different depths and quality from fresh to brackish waters. Six of the 22 associations are listed in the Natura 2000 European network as being priority areas for conservation purposes. Wetland communities by nature tend to be restricted in distribution and extent, but their overall occurrence has been greatly reduced through drainage and conversion to agricultural land, particularly on the alluvial floodplain area. Nevertheless the remaining wetlands provide essential habitat for a wide variety of fauna, notably aquatic animals, including mammals and birds (particularly waterbirds and migratory birds), reptiles, amphibians, fresh water fish and invertebrates. Key wetland areas include the Buna River and delta, Domni Marsh and Viluni Lagoon, and the Velipojë wetlands encapsulated within the core conservation area. Wetland habitats are important areas for hunting and fishing (freshwater fisheries, lagoon fisheries and sea fisheries), and play an essential role in terms of groundwater recharge, with the majority of residents in being dependent on shallow aquifers for drinking water supplies.



Figure 30 Kaneta e Dormi wetland – Laggja e Re (07.04.2022)

Aquatic habitats. Freshwater aquatic submerged vegetation in the area is represented by many associations. The communities *Potamogetonum lucentis*, *Najadetum marinae* and *Najadetum minoris* and *Ceratophylletum demersi* are dominating within area. The communities of *Potamogetonum perfoliatum*, *Potamogetono- Vallisnerietum* and *Ceratophyllo demersi-Vallisnerietum spiralis* occupy the largest area of aquatic submerged vegetation.



Figure 31 Buna River (24.10.2025)



Figure 32 Drini River (24.10.2025)

Agricultural habitats. Agricultural habitats are dominant in the Area of Interest. They are represented by fields and acres and in smaller part by scattered orchards (including olive grooves) and small vineyards. During the field work we also recorded small number of actively managed hay meadows. We should note that the abandoned fields and acres constitute significant portion of the agricultural land.



Figure 33 Agricultural land (24.10.2025)

Habitat (EUNIS classification)	EU Habitats Directive (Annex I)	Comments
C1.3 : Permanent eutrophic lakes, ponds and pools	Not listed (not important)	All of the ponds along rivers of Buna and Gjadri. These habitats cover surface of 2.14 ha in the AoI (Area of Interest) and 1.04 ha in the buffer area (2x500m).
C1.33 Rooted submerged vegetation of eutrophic waterbodies	Not listed (not important)	Skadar lake, slow-flowing parts of rivers. See above habitat.
F9.35: Riparian stands of invasive shrubs	/ Not listed(not important)	Riparian stands of invasive alien species <i>Amorpha fruticosa</i> shrubs. This habitat covers very small areas represented by narrow belt, mainly along rivers.
A2.5 Coastal saltmarshes and saline reedbeds	1310 Salicornia and other annuals colonising mud and sand	Adriatic coast near Velipoja. Not to be directly affected.
D6.2 Inland saline or brackish species-poor helophyte beds normally without free-standing water	1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	Velipoja salt marshes. Not to be directly affected.
A2.526 Mediterranean saltmarsh scrubs	1420 - Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)	Velipoja salt marshes. Not to be directly affected.
B1.31 Embryonic shifting dunes	2110 Embryonic shifting dunes	Adriatic coast. Not to be directly affected.
C1.32 Free-floating vegetation of eutrophic waterbodies	3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	Skadar lake. Not to be directly affected.
E5.44 Mediterranean grasslands on alluvial river banks	3280 - Constantly flowing Mediterranean rivers with <i>Paspalo Agrostidion</i> species and hanging curtains of <i>Salix</i> and <i>Populus alba</i>	Rivers Buna and Gjadri. These habitats occupy very narrow belts along rivers and their mapping is very difficult (separation from 92A0)
C3.2 - Water-fringing reedbeds and tall helophytes other than canes	72A0-Drainage Channels- Reed beds (Phragmito-Magnocaricetea)	Connecting secondary and tertiary irrigation and drainage channels spread mostly along the River Gjadri . (see comments on other C3 habitats).
G1.2 Mixed riparian floodplain and gallery woodland	91F0 Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers (<i>Ulmion minoris</i>)	Mainly River Buna, but also fragmented along other rivers and scattered in the landscape. The habitats G1.2 and G1.31 cover a surface of approximately 2.34 ha in the AoI (Area of Interest) and 1.34 ha in the buffer area (2x500m).
G1.31 Mediterranean riparian <i>Populus</i> forests	92A0 - <i>Salix alba</i> and <i>Populus alba</i> galleries	Dominant habitat along rivers of Buna and Gjadri
G1.73752 : Illyrian oriental hornbeam white oak woods	/	Hilly areas on limestone bedrock along the alignment and wider area. Not to be directly affected. Represented by small surfaces in the Buffer area (additional mapping is needed).

Habitat (EUNIS classification)	EU Habitats Directive (Annex I)	Comments
G1.78 <i>Quercus trojana</i> woodland	9250 <i>Quercus trojana</i> woods	Hilly areas on limestone bedrock near Velipoja. The alignment does not cross this habitat.
F9. 3 Southern riparian galleries and thickets	92D0 Southern riparian galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae)	Surroundings of Velipoja. Not to be directly affected.

Table 13 Natural and seminatural habitats recorded along the project area

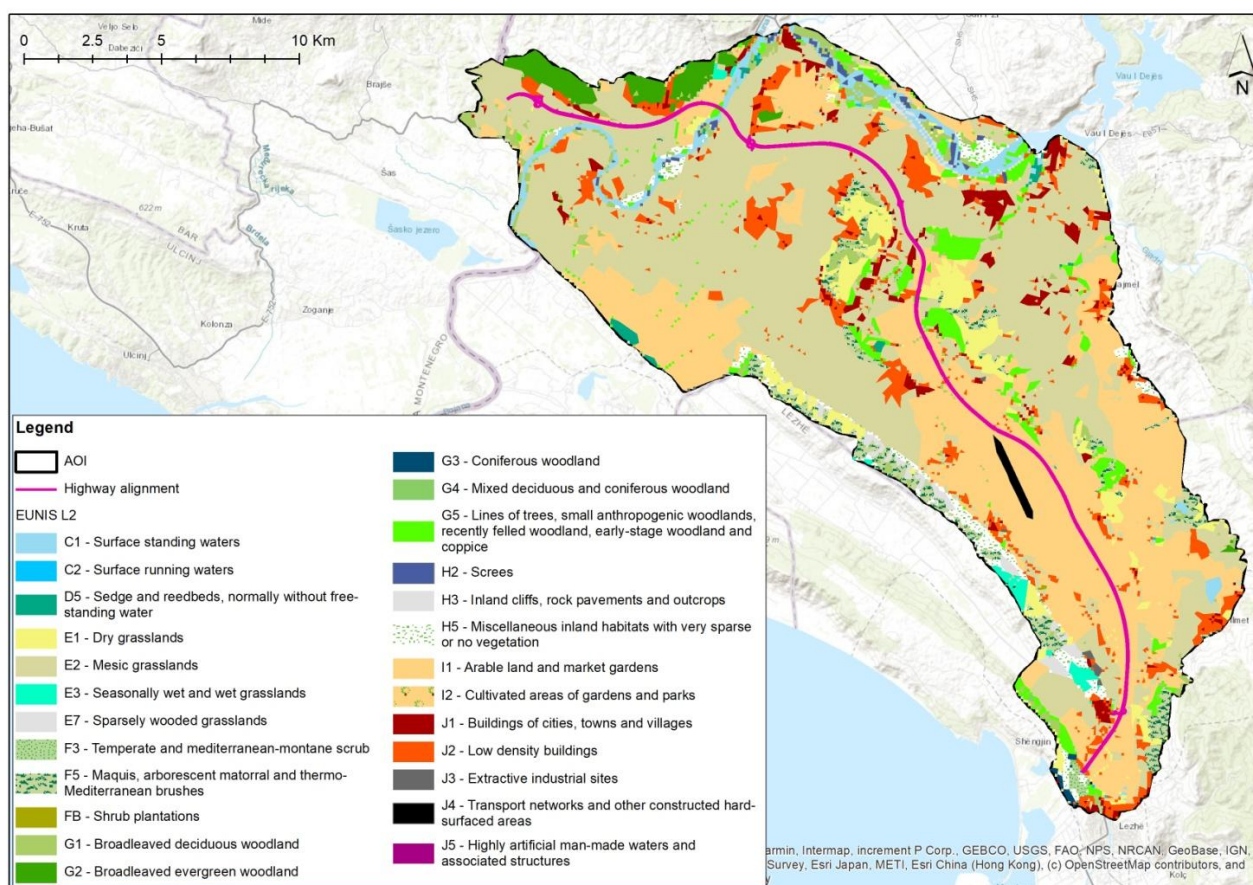


Figure 34 Map of EUNIS level 2 habitats in the Study area

EUNIS L2 habitat type	Area of interest (study area)		Buffer (2x500m)	
	Surface (ha)	Percentage (%)	Surface (ha)	Percentage (%)
C1 - Surface standing waters	743.51	2.14	42.68	1.04
C2 - Surface running waters	6.00	0.02	0.00	0.00
D5 - Sedge and reedbeds, normally without free-standing water	110.40	0.32	0.00	0.00
E1 - Dry grasslands	1477.56	4.26	0.00	0.00

EUNIS L2 habitat type	Area of interest (study area)		Buffer (2x500m)	
	Surface (ha)	Percentage (%)	Surface (ha)	Percentage (%)
E2 - Mesic grasslands	14390.48	41.49	56.18	1.37
E3 - Seasonally wet and wet grasslands	168.54	0.49	1620.59	39.40
E7 - Sparsely wooded grasslands	2.00	0.01	1.64	0.04
F3 - Temperate and mediterranean-montane scrub	61.65	0.18	25.05	0.61
F5 - Maquis, arborescent matorral and thermo-Mediterranean brushes	1022.74	2.95	2.32	0.06
FB - Shrub plantations	5.97	0.02	0.00	0.00
G1 - Broadleaved deciduous woodland	813.33	2.34	55.16	1.34
G2 - Broadleaved evergreen woodland	604.25	1.74	27.01	0.66
G3 - Coniferous woodland	32.71	0.09	1.58	0.04
G4 - Mixed deciduous and coniferous woodland	10.64	0.03	1.83	0.04
G5 - Lines of trees, small anthropogenic woodlands, recently felled woodland, early-stage woodland and coppice	1187.33	3.42	73.31	1.78
H2 - Scree	127.00	0.37	3.16	0.08
H3 - Inland cliffs, rock pavements and outcrops	314.16	0.91	0.00	0.00
H5 - Miscellaneous inland habitats with very sparse or no vegetation	690.13	1.99	11.78	0.29
I1 - Arable land and market gardens	9798.84	28.25	1928.19	46.88
I2 - Cultivated areas of gardens and parks	2.00	0.01	0.00	0.00
J1 - Buildings of cities, towns and villages	865.51	2.50	65.65	1.60
J2 - Low density buildings	2119.62	6.11	187.97	4.57
J3 - Extractive industrial sites	33.41	0.10	0.00	0.00
J4 - Transport networks and other constructed hard-surfaced areas	96.24	0.28	2.00	0.05
J5 - Highly artificial man-made waters and associated structures	1.00	0.00	7.35	0.18
Grand Total	34685.02	100.00	4113.45	100.00

Table 14 Indicative surfaces of EUNIS level 2 habitats in the Area of Interest and in the Buffer of 2x500m

5.1.14.3 Flora

The flora in the area is consisted of Mediterranean and Submediterranean species in the preserved terrestrial habitats; wetland species in the area of aquatic ecosystems (Skadar lake, Buna River) and mostly ruderal species in the agricultural area. The diversity of the flora is not exceptional for a Mediterranean area.



Figure 35 *Laurus nobilis*, *Galanthus nivalis*, *Nasturtium officinale* and *Cynanchum acutum* (08.04.2022)

The important plant species are presented in the following table. A total of 10 target plant species of particular conservation interest were identified (species with limited distribution, or threatened according to IUCN Red List criteria, or included in other international conventions). According to the red data list for Albania, four of these species are classified as Endangered, and the remaining six as Vulnerable. Of these 10 species, nine are included in the red data list for Europe (three as Near Threatened, six as Least Concern) and six for the world (all Least Concern).

Only *Hypericum perforatum* was recorded in the immediate vicinity of the project road. English oak (*Quercus robur*) is known for the riparian and flooded forests in the Buna River – Velipoja protected area. However, no

trees of this species were observed in the vicinity of the projected motorway (special attention was paid at the crossings of rivers Buna, Drini and Gjader). Both *Salvia officinalis* and *Satureja montana* were observed on limestone rocks in the vicinity of the projected motorway (hills between Murriqan and Oblikë), however no effects of the roads construction/operation may be expected. *Salvia officinalis* is, a shrub which is harvested for commercial purposes and which may be threatened by over exploitation.

Scientific name	Common name	IUCN global	Albanian red list	Habitat
<i>Marsilea quadrifolia</i>	European watercress	LC	EN	Aquatic
<i>Hydrocotyle vulgaris</i>	Marsh pennywort	LC	VU	Aquatic
<i>Hydrocharis morsus-ranae</i>	European frogbit	LC	VU	Aquatic
<i>Anacamptis laxiflora</i>	Lax-flowered orchid			Wet meadows
<i>Anacamptis palustris</i>	Orchis des Marais	LC		Wet meadows
<i>Pancratium maritimum</i>	Sea daffodil		EN	Maritime sands
<i>Desmazeria marina</i>			VU	Maritime sands
<i>Ephedra distachya</i>	Sea grape	LC	EN	Widespread
<i>Salix fragilis</i>	Crack willow	N/A	VU	Riparian habitats
<i>Quercus robur</i>	English oak	LC	EN	Riparian forests
<i>Olea oleaster</i>	Wild olive			Hills and orchards
<i>Laurus nobilis</i>	Bay laurel	LC	EN	Widespread
<i>Hypericum perforatum</i>	St. John's wort	LC	EN	Meadows and other grasslands
<i>Satureja montana</i>	Winter savory		VU	Oak forests and shrublands and on limestone rocks
<i>Butomus umbellatus</i>	Flowering- rush	LC	VU	Wetlands, aquatic habitats
<i>Cladium mariscus</i>	Great fen- sedge	LC	VU	Wetlands
<i>Nuphar lutea</i>	Yellow water- lily	LC	VU	Wetlands, aquatic habitats
<i>Nymphaea alba</i>	European white waterlily	LC	VU	Wetlands, aquatic habitats
<i>Nymphoides peltata</i>		LC	VU	Wetlands, aquatic habitats
<i>Sagittaria sagittifolia</i>	Arrowhead	LC	VU	Wetlands, aquatic habitats
<i>Trapa natans</i>	Water caltrop		EN	Aquatic
<i>Adiantum cappillus-veneris</i>	Maidenhair Fern	LC	VU	Terrestrial – rocky crevices
<i>Baldellia ranunculoides</i>	Lesser water- plantain	NT	CR	Wetlands, coastal habitats
<i>Spirodela polyrhiza</i>	Greater duckweed	LC	VU	Wetlands

Scientific name	Common name	IUCN global	Albanian red list	Habitat
<i>Ulmus minor</i>	Field elm	DD	VU	Wetlands
<i>Hippuris vulgaris</i>	COMMON mare's-tail	LC	CR	Wetlands
<i>Nymphoides peltata</i>	yellow floating-heart	LC	VU	Wetlands
<i>Origanum vulgare</i>	Oregano		EN	Grasslands

Table 15 List of target plant species of particular conservation interest , .

A number of alien species were also recorded, especially in humid habitats (along channels and rivers): Giant reed (*Arundo donax*), False indigo-bush (*Amorpha fruticosa*), "Running bamboo" (cf. *Fargesia murielae*, Umbrella Bamboo), *Erigeron canadensis*, *Datura stramonium*, *Physalis angulatus* Black locust (*Robinia pseudoacacia*), etc.



Figure 36 Black locust (*Robinia pseudoacacia*) (left) and Giant reed (*Arundo donax*) (right) along river Gjader (20.01.2022)

5.1.14.4 Mammals

The most common mammal species within the Buna River – Velipoja Protected Landscape are: *Lepus europaeus* (Common Hare), *Vulpes vulpes* (Red Fox), *Canis aureus* (Golden Jackal), *Meles meles* (European Badger), *Mustela nivalis* (Least Weasel) and *Sus scrofa* (Wild Boar) (Beqiraj, 2006). Euronatur (2006) recorded the presence of 22 mammal species including *Canis aureus* (Golden Jackal), *Ursus arctos* (Brown Bear) and, in the Buna River, Buna delta and adjacent sea, *Tursiops truncatus* (Bottlenose Dolphin), and the globally threatened European Otter (*Lutra lutra*). In addition to habitat loss and fragmentation, mammal species are probably threatened by high levels of hunting.

Species	IUCN	Bern Convention	Habitats Directive	Fieldwork observation
<i>Canis aureus</i>	LC	-		
<i>Erinaceus roumanicus</i>	LC	-		√
<i>Lepus europaeus</i>	LC	-		√
<i>Lutra lutra</i>	NT	II	II, IV	
<i>Martes foina</i>	LC	III		√
<i>Nyctalus noctula</i>	LC	II		

Species	IUCN	Bern Convention	Habitats Directive	Fieldwork observation
<i>Oryctolagus cuniculus</i>	NT	-		
<i>Sus scrofa</i>	LC	-		
<i>Stenella coeruleoalba</i>	DD	II		
<i>Tursiops truncatus</i>	DD	II	II	
<i>Vulpes vulpes</i>	LC	-		√
<i>Meles meles</i>	LC	III		

Table 16 List of target mammal species of conservation interest.

5.1.14.4 Ornithofauna

The area of Buna and Velipoja supports a rich bird community, particularly of waterbirds. The study of Euronatur (2006) recorded the presence of 238 bird species. These included 114 breeding birds (status: breeding confirmed and probably breeding) and 16 species possibly breeding in the area. In addition, 52 species are classified as regular and 51 as occasional passage migrants or winter visitors. Together with a number of species of conservation concern, the presence of high numbers of wintering waterbirds was one of the motivations for declaring the BRPL and Lake Shkodra as a Ramsar site. High and uncontrolled levels of hunting remain a major concern for bird populations within the BRPL.

During the fieldwork we observed smaller number of species. It is striking that the bird fauna on Buna River was not rich in species as expected. Only, common waterfowls were observed (*Phalacrocorax carbo*, *Ardea cinerea*, *Gallinula chloropus*, *Fulica atra*, *Ardeola ralloides*, *Anas platyrhynchos*, wintering *Alcedo atthis* etc.)

List of target bird species and their conservation status is presented in Annex 1.

5.1.14.5 Reptiles

Euronatur (2006) recorded the presence of 19 reptile species within the Buna River-Velipoja Protected Landscape, all of which are included on the IUCN red data list: four as Near Threatened, 10 as Least Concern and five as Not Evaluated.

Class	Species	IUCN Global Red	EU Red List	Red List of Albania	EU Habitat directive	Bern Convention	CITES	Endemism
Reptilia	<i>Testudo hermanni</i>	NT	NT	LRnt	II/IV	II	II	/
Reptilia	<i>Emys orbicularis</i>	NT	NT	LRnt	II/IV	II	/	/
Reptilia	<i>Mauremys rivulata</i>	/	LC	/	II/IV	II	/	/
Reptilia	<i>Algyroides nigropunctatus</i>	LC	LC	LRcd	IV	II	/	/
Reptilia	<i>Lacerta trilineata</i>	LC	LC	/	IV	II	/	/
Reptilia	<i>Lacerta viridis</i>	LC	LC	LRcd	IV	II	/	/
Reptilia	<i>Podarcis muralis</i>	LC	LC	NE	IV	II	/	/

Class	Species	IUCN Global Red	EU Red List	Red List of Albania	EU Habitat directive	Bern Conventio n	CITES	Endemism
Reptilia	<i>Podarcis tauricus</i>	LC	LC	LRnt	IV	II	/	/
Reptilia	<i>Podarcis meliselensis</i>	LC	LC	/	IV	III	/	/
Reptilia	<i>Podarcis siculus</i>	LC	LC	/	IV	III	/	/
Reptilia	<i>Dinarolacerta oxycephala</i>	/	/	/	/	III	/	/
Reptilia	<i>Ablepharus kitaibelii</i>	LC	LC	LRnt	IV	II	/	/
Reptilia	<i>Hemidactylus turcicus</i>	LC	LC	LRcd	/	III	/	/
Reptilia	<i>Mediodactylus kotschy</i>	LC	LC	/	IV	II	/	/
Reptilia	<i>Anguis fragilis</i>	NT	LC	NE	/	III	/	/
Reptilia	<i>Pseudopus apodus</i>	LC	LC	LRnt	IV	II	/	/
Reptilia	<i>Platycephalus najadum</i>	LC	LC	/	IV	II	/	/
Reptilia	<i>Elaphe quatuorlineata</i>	NT	NT	CR	II/IV	II	/	/
Reptilia	<i>Zamenis longissimus</i>	LC	LC	/	IV	II	/	/
Reptilia	<i>Zamenis situla</i>	LC	LC	CR	II/IV	II	/	/
Reptilia	<i>Malpolon insignitus</i>	LC	LC	/	/	III	/	/
Reptilia	<i>Natrix natrix</i>	LC	/	NE	/	III	/	/
Reptilia	<i>Natrix tessellata</i>	LC	LC	/	IV	II	/	/
Reptilia	<i>Dolichophis caspius</i>	LC	LC	/	IV	II	/	/
Reptilia	<i>Hierophis gemonensis</i>	LC	LC	/	/	II	/	/
Reptilia	<i>Telescopus fallax</i>	LC	LC	LRlc	IV	II	/	/
Reptilia	<i>Vipera ammodytes</i>	LC	LC	LRnt	IV	II	/	/

Table 17 List of reptile species with conservation status

5.1.14.6 Amphibians

There are about 16 species of amphibians known in Albania, of which 5 species belong to the order Caudata (Amphibians with tail), which includes tritons and salamanders, while the 11 other species belong to the Anura Order (Tailless Amphibians), which includes all species of frogs and toads (Szabolcs et al., 2017). Among them the most significant one is *Pelophylax shqipericus* - an endemic species of the Balkans, with a natural spread

in Albania and Montenegro, starting in the north from Shkodra Lake, continuing along the coastline to the area of Vlora (Orikum) in the south (Speybroeck et al., 2016). Very little data exist regarding the origin and ecology of the frog *P. shqipericus* (Uzzell & Crnobrnja-Isailovi, 2009). Recently, this species was reported for the first time in Italy, where it is thought to have been introduced through international frog trade (Domeneghetti et al., 2013). The wider area covering River Buna, River Gjadri and associated aquatic ecosystems hosts a large number of amphibian species, likely attributed to the diversity of habitat types and refuges within this landscape

Lake Skadar and River Buna Ramsar site and the Buna River Protected Landscape provide habitat for 11 species of amphibian (Ramsar, 2005). Of these, only one species was reported as being of conservation importance, namely the European tree frog (*Hyla arborea*; IUCN LC; Albanian Red List LR/cd). The walkover survey identified that habitats present within the project footprint on in vicinity of planned bridge in River Buna that are suboptimal to support amphibians throughout their entire lifecycle. The project area is also considered to offer potentially suitable habitat to support the following amphibian species of conservation importance presented in the table below.

Class	Species	IUCN Global Red List	EU Red List	Red List of Albania	EU Habitat directive	Bern Convention	CITES	Endemis m
Amphibia	<i>Bombina variegata</i>	LC	LC	/	II/IV	II	/	<i>B. v. scabra</i> is Balkan endemic
Amphibia	<i>Bufo bufo</i>	LC	LC	LRnt	/	III	/	/
Amphibia	<i>Bufo viridis</i>	LC	LC	/	IV	II	/	/
Amphibia	<i>Hyla arborea</i>	LC	LC	LRcd	IV	II	/	/
Amphibia	<i>Pelophylax epeiroticus</i>	NT	NT	/	/	III	/	/
Amphibia	<i>Pelophylax kurtmuelleri</i>	LC	LC	/	/	III	/	/
Amphibia	<i>Pelophylax shqipericus</i>	VU	VU	/	/	III	/	/

Table 18 List of amphibian species and their conservation status

The habitat loss and fragmentation is considered to be the biggest threatening factor to amphibian populations. This is a result of interventions in the system of the marsh drainage canals; urbanization and intensification of agriculture, which leads, in turn, to water pollution from numerous pesticides. Another direct threat is the collection without any criteria of these species for commercial purposes (Gratwicke et al., 2010).



Figure 37 *Bufotes viridis* in sandy dunes near Velipoja (07.04.2022)

5.1.14.7 Fish species

The complex of aquatic ecosystems within project area that include River Buna, River Gjadri and Lake Shkodra represents one of the most important centers of biodiversity for Western Balkan and Southeastern Europe. The region is a unique example of well-preserved freshwater ecosystems with specific geomorphologic, hydrological, soil and climatic features. It is also characterized by high biodiversity including numerous endemic and relict species of flora and fauna (Crivelli, 1996; Weiss et al., 2018; Freyhof et al., 2020).

Fish fauna of the area is characterized by high number of species. That includes number of freshwater and marine fish species, which periodically inhabit the Lake Shkodra. The structure of fish species been influenced by number of factors. First of all, there is geographic position and character of the lake, climate, physical and chemical characteristic of water and connection with rivers and Adriatic Sea. It has also been influenced by Ohrid-Drin-Shkodra system, that connects lakes, river and sea ecosystem.



Figure 38 Fish species: A. *Alburnoides ohridanus*; B. *Alburnus scoranza*; C. *Barbus rebeli*; D. *Cobitis ohridana*; ns. E. *Chondrostoma ohridanus*; F. *Squalius platyceps*; G. *Salaria fluviatilis*; G. *Pachychilon pictum*.

River Buna that drains from the lake is the main migratory road between lake and sea and allows migration of catadromous and anadromous fish species into the lake. Although there are no dams on this migratory route, wire nets that occurs on Buna River downstream from city of Shkodra significantly minimize migration possibility for both type of migration fish species. Presence of large number of sublacustric springs gives particular specificity to biology and ecology of ichthyic fauna components. Following Mrdak et al., (2001), that is particularly obvious in winter period, these habitats characterized by favorable thermal regime which makes them important winter habitats for some fish species. In the same time, those areas represent main points of harvesting of economy important fish species (dominantly *Alburnus scoranza*).

The number of fish species in River Buna, River Gjadri and Lake Shkodra system was significantly increased in last decades because of uncontrolled stocking of non-native fish species which were originally from Black Sea drainage area (*Hypophthalmichthys molitrix*, *Thymallus thymallus*, *Carassius gibelio*, *Perca fluviatilis*, etc.). But beside those introductions, the Lake Shkodra and associated water bodies are inhabited by several endemic species from families Salmonidae, Cyprinidae, Gobiidae and Cobitidae. The Lake is also spawning or growing zone for several anadromous and catadromous (migratory) fish species (e.g. *Alosa falax*, *Anguilla anguilla*, *Acipenser* sp.), as well as for estuary fish species (*Mugil cephalus*, *Dicentrarchus labrax*, *Platichthys flesus flesus*). River Buna and Lake Shkodra, being at a low altitude, shallow, and warm, is an ideal cyprinid lake. But presence of small tributaries, big ones (Morača river in Montenegro, Kiri River in Albania etc.) and sublacustric springs with relatively low and constant temperature allow salmonid fish fauna to live sympatric in the Lake (*Salmo farioides*). As a consequence, fish assemblage of project area aquatic ecosystems is characterized by a unique combination of cold and warm water species and an extraordinary species diversity.

Species	Occurrence	National Red list	IUCN Red list	EUR HAB-DIR	Bern Convention	CITES
Fam. Acipenseridae						

Species	Occurrence	National Red list	IUCN Red list	EUR HAB-DIR	Bern Convention	CITES
<i>Acipenser naccarii</i>	Native	EN	CR	II+IV	II	II
<i>Acipenser sturio</i>	Native	EN	CR	V	II+III	I
Fam. Anguillidae						
<i>Anguilla anguilla</i>	Native		CR			II
Fam. Atherinidae						
<i>Atherina boyeri</i>	Native		LC			
Fam. Balitoridae						
<i>Barbatula zetensis</i>	Native		VU			
Fam. Blennidae						
<i>Salaria fluviatilis</i>	Native	LRcd	LC			
Fam. Petromyzontidae			LC			
<i>Eudontomyzon stankokaramani</i>	Native			II		
Fam. Centrarchidae						
<i>Lepomis gibbosus</i>	Introduced		LC			
Fam. Citharidae						
<i>Citharus linguatula</i>	Native		LC			
Fam. Clupeidae						
<i>Alosa fallax</i>	Native	VU	LC	II		
Fam. Cobitidae			LC			
<i>Cobitis ohridana</i>	Endemic	LRcd	LC			
<i>Sabanejewia balcanica</i>	Native		LC			
Fam. Cyprinidae						
<i>Alburnoides ohridanus</i>	Endemic		VU		III	
<i>Alburnus scoranza</i>	Endemic		LC			
<i>Barbus rebeli</i>	Native	LRcd	LC			
<i>Chondrostoma ohridanus</i>	Endemic	LRcd	NT		III	
<i>Squalis platyceps</i>	Endemic		LC			
<i>Rutilus ohridanus</i>	Endemic		LC			
<i>Pachichilon pictum</i>	Endemic		LC		III	
<i>Phoxinus sp.</i>						

Species	Occurrence	National Red list	IUCN Red list	EUR HAB-DIR	Bern Convention	CITES
<i>Cyprinus carpio</i>	Introduced		NA			
<i>Carassius gibelio</i>	Introduced					
<i>Carassius auratus</i>	Introduced		LC			
<i>Rhodeus amarus</i>	Introduced		LC	II	I	
<i>Pseudorasbora parva</i>	Introduced					
<i>Ctenopharyngodon idella</i>	Introduced					
<i>Hypophthalmichthys molitrix</i>	Introduced					
<i>Hypophthalmichthys nobilis</i>	Introduced					
<i>Megalobrama terminalis</i>	Introduced					
<i>Mylopharyngodon piceus</i>	Introduced					
<i>Scardinius knezevici</i>	Endemic		LC			
<i>Telestes montenigrinus</i>	Endemic		LC			
<i>Tinca tinca</i>	Introduced		LC			
Fam. Gasterosteidae						
<i>Gobio scadarensis</i>	Endemic	LRnt	EN			
<i>Gasterosteus gymnotus</i>	Native	LRlc	LC			
Fam. Gobidae						
<i>Pomatoschistus montenegrensis</i>	Native		LC			
Fam. Ictaluridae						
<i>Ameiurus nebulosus</i>	Introduced		LC			
Fam. Moronidae						
<i>Dicentrarchus labrax</i>	Native		LC			
Fam. Mugilidae						
<i>Liza ramada</i>	Native		LC			
<i>Mugil cephalus</i>	Native		LC			
Fam. Percidae						

Species	Occurrence	National Red list	IUCN Red list	EUR HAB-DIR	Bern Convention	CITES
<i>Perca fluviatilis</i>	Introduced		LC			
<i>Sander luciperca</i>	Introduced		LC			
Fam. Poeciliidae						
<i>Gambusia holbroki</i>	Introduced		LC			
Fam. Salmonidae						
<i>Salmo faroides</i>	Native	LRcd				
<i>Oncorhynchus mykiss</i>	Introduced					

Table 19 List of fish species found in project area and their conservation status

Based on researches conducted so far, there are 49 species registered in River Buna and Lake Shkodra. There are 37 native and 13 introduced fish species (Marić & Milošević, 2011). In the basin of Lake Shkodra 7 fish species (18.3 %) are endemics. The endemics autochthonous fishes from Lake and its catchment area are: *Salmo zetensis* (Hadžišće, 1962); *Barbatula zetensis* (Šorić, 2000); *Chondrostoma scodrensis* (Elvira 1987); *Gobio skadarensis* (Karaman, 1936); *Knipowitschia montenegrina* (Kovačić & Šanda, 2007); *Pomatoschistus montenegrensis* (Miller & Šanda, 2008) and *Rutilus albus* (Marić, 2010). Natura 2000 list includes following species: *Acipenser naccarii* (Bonaparte, 1836), *Acipenser sturio* (Linnaeus 1758), *Alosa falax* (La Cepède, 1803), *Rhodeus amarus* (Bloch, 1782), *Telestes montenigrinus* (Vuković, 1963), *Knipowitschia montenegrina* (Kovačić & Šanda, 2007).

Important invertebrates

Freshwater mussels seem to be an important biodiversity component in the project area that included aquatic ecosystems. The presence of the freshwater mussel species has been recorded in both River Buna and Gjadri during field observations conducted in April 2022. The wider area (including up and downstream of Vau i Dejes dam, Lake Shkodra and River Gjadri) is home of the freshwater mussel *Microcondylaea bonellii* (Férussac, 1827) assessed as a vulnerable (VU) one at the IUCN Red List (Albrecht et al, 2011) and is also listed in Annex V of the Flora-Fauna-Habitat Directive of the EU. The natural system modifications and water pollution are considered as a threat for its population, once following the recent data it is considered a suitable host for *Rhodeus amarus* (Souza et al., 2020). So, during a survey in July 2019 in the Skadar Lake basin the bitterling embryos (identified visually) in different stages of development were found inside *M. bonellii*, while in Drin River (41.890205, 19.571525), of a total of 7 *M. bonellii* analysed, 4 had bitterling embryos (57.1%) and in Gjadri River (41.905293, 19.581752), 8 of 14 *M. bonellii* analysed had bitterling embryos (57.1%).

Following the Species assessments at EU biogeographical level, in Article 17 reports 2012 the species is reported from the Continental and Mediterranean biogeographical regions. Unfortunately, beside that the population size is reduced and distribution rate become smaller, *Microcondylaea bonellii* is not listed in the Albanian Red List.

Presence of *Dreissena stankovici* (L'vova and Starobogatov, 1982) is recorded mostly on the rocky in the littoral rocky locations. Beside previous discussions, the taxonomic status of the species is confirmed by Wilke et al., (2010) through molecular analyses. The species status is threatened since in River Buna there are records for the presence of highly invasive representatives of this genus (Wilke et al., 2010), the zebra mussel *Dreissena polymorpha* (Pallas, 1771). So the originally native species, nominal *Dreissena stankovici*, L'vova and Starobogatov, 1982, supposedly endemic to Lake Ohrid, is not restricted to the ancient lakes Ohrid and Prespa, but that it is a widespread taxon in the northern part of the area. The presence of *Dreissena larvae* stages in zooplankton is confirmed by Shumka et al. (2018).



Figure 39 *Dreissena stankovici* (L'vova and Starobogatov, 1982) in the project area



Figure 40 *Microcondylaea bonellii* (Férussac, 1827) of river Gjader (06.04.2022)

In the IUCN Red List *Dreissena stankovici* (L'vova and Starobogatov, 1982) is assessed as Near Threaten (NT) (Sedon, 2011), while the natural system modifications (Dam/water management and use) and pollution (including domestic & urban waste water, industrial & military effluents, agricultural & forestry effluents, etc) are considered as a threat for their populations and survival. In the following table are presented the most significant invertebrate species and their conservation status.

No.	Species	IUCN Red list	Albanian Red List	Bern Convention Annexes	EUR HAB DIREC Annexes
Gastropoda					
1	<i>Radomaniola elongata</i>	CR			
2	<i>Radomaniola lacustris</i>	CR			
3	<i>Bithynia zeta</i>	EN			
4	<i>Bithynia skadarskii</i>	EN			
5	<i>Vinodolia scutarica</i>	EN			
6	<i>Vinodolia matjasici</i>	CR			

No.	Species	IUCN Red list	Albanian Red List	Bern Convention Annexes	EUR HAB DIREC Annexes
7	<i>Plagigeyeria zetaprotogona</i>	EN			
8	<i>Plagigeyeria zetaprotogona vitoja</i>	EN			
9	<i>Valvata montenegrina</i>	EN			
10	<i>Stagnicola montenegrinus</i>	NT			
11	<i>Radix skutaris</i>	EN			
12	<i>Gyraulus ioanis</i>	CR			
13	<i>Gyraulus meierbrooki</i>	EN			
14	<i>Gyraulus shasi</i>	CR			
Bivalvia					
1	<i>Unio crassus</i>	EN			
2	<i>Unio mancus</i> (syn. <i>U. elongatulus</i>)	NT			
3	<i>Microcondylaea bonellii</i>	VU			
5	<i>Dreissena carinata</i> ⁸	NT			
Arthropoda					
	<i>Crustacea</i>				
	<i>Astacus astacus</i>			III	
	<i>Insecta</i>				
	<i>Zerynthia polyxena</i>				II

Table 20 List of most significant aquatic invertebrate conservation status

During the field work we also recorded *Zerynthia polyxena* which is an important species according to the EU Habitats Directive. Additionally, some other important species may be expected: *Lucanus cervus* (HD, oak forests), *Cerambyx cerdo* (HD, oak forests), *Morimus funereus* (HD, oak and riparian forests), etc.

⁸ Includes *D. presbensis* Kobelt, 1915 and *D. stankovici* Lvova and Starobogatov, 1982

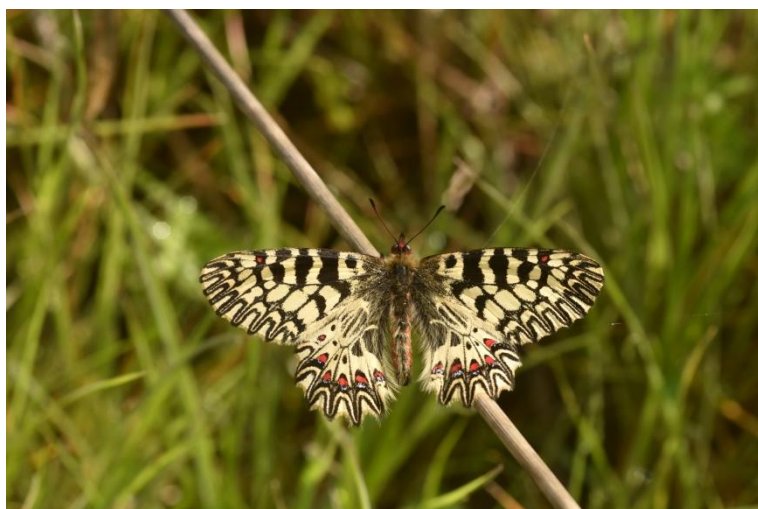


Figure 41 Zerynthia polyxena in a meadow (42.016480, 19.464824) near Buna River crossing (08.04.2022)

5.1.15 Ecosystem services assessment

The methodological approach involved selection, assessment of ecosystem services and assessment of perceived change in ecosystem services supply in the Preliminary ESIA elaboration. The selection of ecosystem services was done in line with the widely used CICES classification. It was driven by the importance/relevance of the ecosystem service to the land use and habitat types present in the study area. Data collection was done by conducting face-to-face interviews with the general local population and relevant stakeholders (beneficiaries of the ecosystem services generated in the area e.g. gatherers of plants, mushrooms and fruits, fisherman, tourist facilities holders etc.).

The most dominant habitat types within the study area are mesic grasslands and arable land. Therefore, 13 ecosystem services classes were selected, representing the three main groups: provisioning, regulating and cultural services. It is important to note that the ecosystem services supply is dependent upon, and connected to, the ecosystem condition of each ecosystem type.

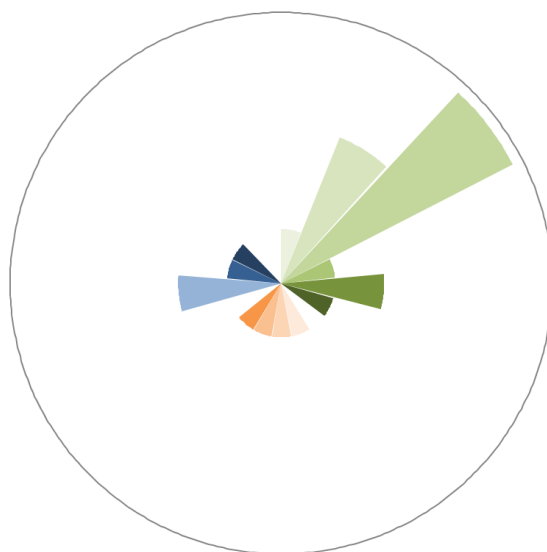
The valuation analysis presents mainly low values for most of the assessed ecosystem services. Even though with highest contribution as number of services, the provisioning services have the highest score values, than the cultural and regulating respectively. It is worth mentioning that none of the regulating ecosystem services were recognised for the study area.

Capacity matrix	Provisioning						Regulating				Cultural		
	Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	Wild animals used for nutrition	Cultivated terrestrial plants (including fungi, algae) grown for	Surface water for drinking	Fibres and other materials from wild plants for direct use or processing (Firewood)	Mineral substances used for material purposes	Regulation of temperature and humidity, including ventilation and transpiration	Fire protection	Pollination	Regulation of baseline flows and extreme events	Characteristics of living systems that are resonant in terms of	Characteristics of living systems that enable aesthetic experiences	Characteristics of living systems that enable education and training
	1	2	3	4	5	6	1	2	3	4	1	2	3

Ecosystem types in the study area	1	2.9	4.8	1	1.9	1	1	1	1	1	1.9	1	1
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Table 21: Capacity matrix with average scores for 13 ecosystem services relevant to the study area

Additional visual representation of the results from the capacity matrix is presented by bundles analysis. The provisioning ecosystem services were observed to have highest supply in the study area, according to the local capacity matrix. This in particular refers to the ecosystem service Cultivated terrestrial plants (including fungi, algae) grown for nutritional purposes which corresponds to the land use in the study area.



Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition
Wild animals used for nutrition
Cultivated terrestrial plants (including fungi, algae) grown for nutritional purposes
Surface water for drinking
Fibres and other materials from wild plants for direct use or processing (Firewood)
Mineral substances used for material purposes
Regulation of temperature and humidity, including ventilation and transpiration
Fire protection
Pollination
Regulation of baseline flows and extreme events
Characteristics of living systems that are resonant in terms of culture or heritage
Characteristics of living systems that enable aesthetic experiences
Characteristics of living systems that enable education and training

Figure 42: Bundles analysis for 13 ecosystem services supplied in all ecosystem types within the study area

5.1.16 Natural Heritage and Protected Areas

There are four nationally protected areas in the AoI: Protected Landscape Buna river-Velipoja (BRPL), Nature Monument Çinari (Foljeta) e Ganjollit, Nature Monument Rrapi i Pirajve and Nature Monument Pylli i Shën Mërisë.

The BRPL is one of 798 existing protected areas in Albania. Most of these comprise nature monuments of limited extent ($n = 750$). There are 55 more extensive protected areas covering a total area of 435,795 ha (Map 4). The BRPL is one of five Protected Landscapes. It accounts for 5% the overall extent of protected areas in Albania.

The Buna River–Velipoja Protected Landscape (BRPL) comprises one of the most important coastal wetlands areas of the country. Located between Lake Shkodra and the Adriatic Sea, the area was designated as a protected landscape in 2005, with a total extent of 23,027 ha. Situated around the delta of the Buna River, the Park supports a great variety of wetland communities. Together with recent coastal dune deposits and inland low karst ridges, the landscape includes a wide diversity of geological types, landscapes, habitats and plant and animal species. From a human perspective the BRPL includes parts of eight communes, for which the total area is 49,294 ha and the total population (2011) was 68,128 inhabitants. Local livelihoods, in the form of crop and livestock production, fishing and tourism, are strongly dependent on the use of constituent natural resources within the BRPL.

The BRPL has been identified as one of 45 Important Plant Areas (IPA); one of 25 potential Emerald Sites; one of 15 Important Bird Areas (IBAs); and forms part of one of three designated Ramsar sites within Albania

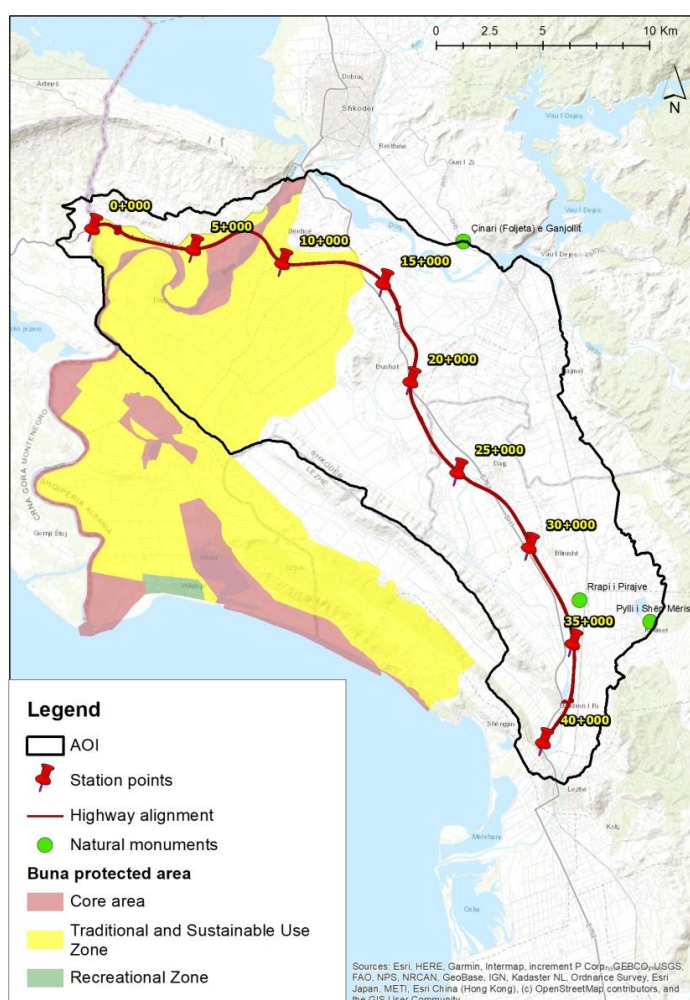


Figure 43 Nationally protected areas (Buna river-Velipoja Protected landscape with zoning and three natural monuments)

The three nature monuments Çinari (Foljeta) e Ganjollit, Rrapi i Pirajve and Pylli i Shën Mërisë are marked as a specific tree, group of trees, grove, habitats and specific biotopes. Çinari (Foljeta) e Ganjollit and Pylli i Shën Mërisë are situated at a considerable distance from the proposed alignment. Additional information is needed on the status of Nature Monument Rrapi i Pirajve.

Important Bird Area Velipoja The site includes two coastal areas: the Viluni (or Velipoja lagoon) (390 ha) and surrounding Velipoja Game Reserve (694 ha); and the inland Dumi wetland (Keneta e Dumit) comprising a large reedbed. It covers an area of 1500 ha. There are only three triggering species recorded in this IBA site.

Species	Season	Year	Pop min	Pop max	Acc	Criteria
<i>Phalacrocorax pygmeus</i> Pygmy Cormorant	W	1996	33	62	A	A1
<i>Phalacrocorax pygmeus</i> Pygmy Cormorant	P	1996	49	49	A	A1
<i>Aquila clanga</i> Greater Spotted Eagle	W	1996	—	3	A	A1

Table 22 Overview of triggering species for establishment of IBA Velipoja

Hérons, *Platalea leucorodia* and *Phalacrocorax pygmeus* used to breed inside the reserve, close to the mouth of the Buna River, but they no longer do so, probably due to increased illegal disturbance and woodcutting inside the reserve. The birds now breed on Ada Island, on the Montenegro side of the river, but still use the habitat on the Albanian side for feeding. The site is also important for wintering waterfowl (max. 8,000 individuals in 1993) and for migratory waterbirds.

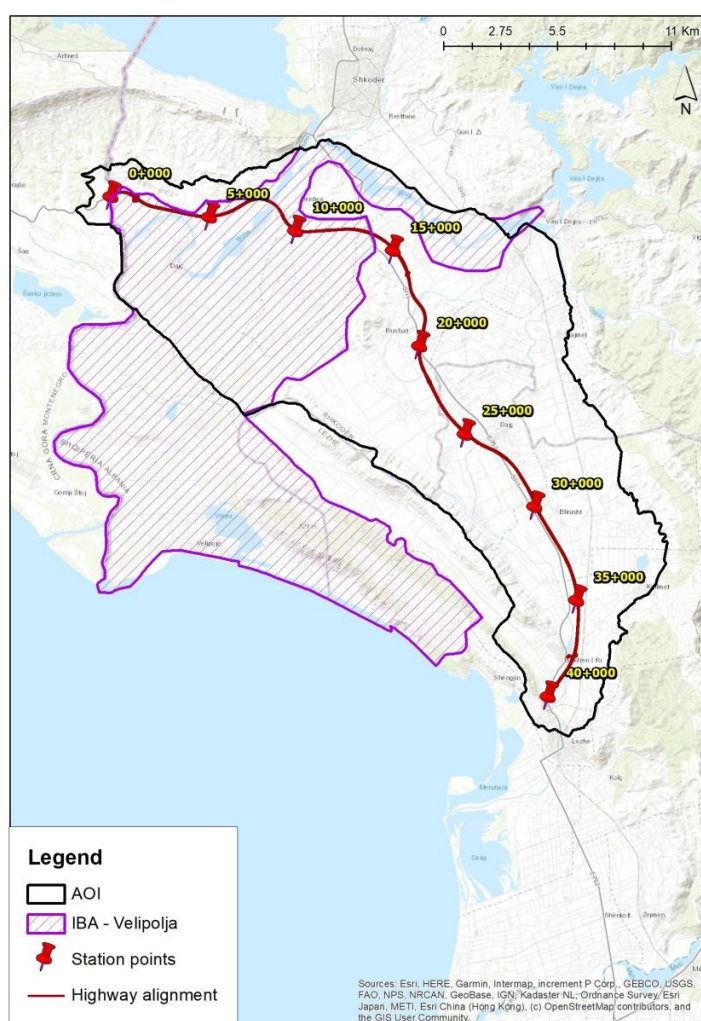


Figure 44 Important Bird Area Velipoja

The site is also recognized as an Important Plant Area Shkodra lake and Buna river. An Important Plant Area (IPA) is a natural or semi-natural site exhibiting exceptional botanical richness and/or supporting an

outstanding assemblage of rare, threatened and/or endemic plant species and/or vegetation of high botanic value. The wetland ecosystem of Lake Shkodra - Buna Delta constitutes a habitat complex favorable for the development of high floristic diversity. Different ecological forms of plants are identified in that region, such as hydrophytes, hygrophytes, helophytes, halophytes, geophytes, psamo-halophytes and psamophytes etc. Based on number of threatened species, richness flora and threatened habitats both sites, Lake Shkodra and Buna Delta in Albanian IPAs (Important Plant Areas) were included. The flora of this region is characterised by a high number of threatened and rare species as well as isolated endemic species. Three globally and European threatened species (*Trapa natans*, *Marsilea quadrifolia* and *Caldesia parnassifolia*) and eight Balkan or local endemic species are evidenced. In the recent Red List of Albanian Flora of 360 species, 128 of them from Shkodra district are included, important number of them belongs to the wetland ecosystem of the Lake Shkodra – Delta Buna .

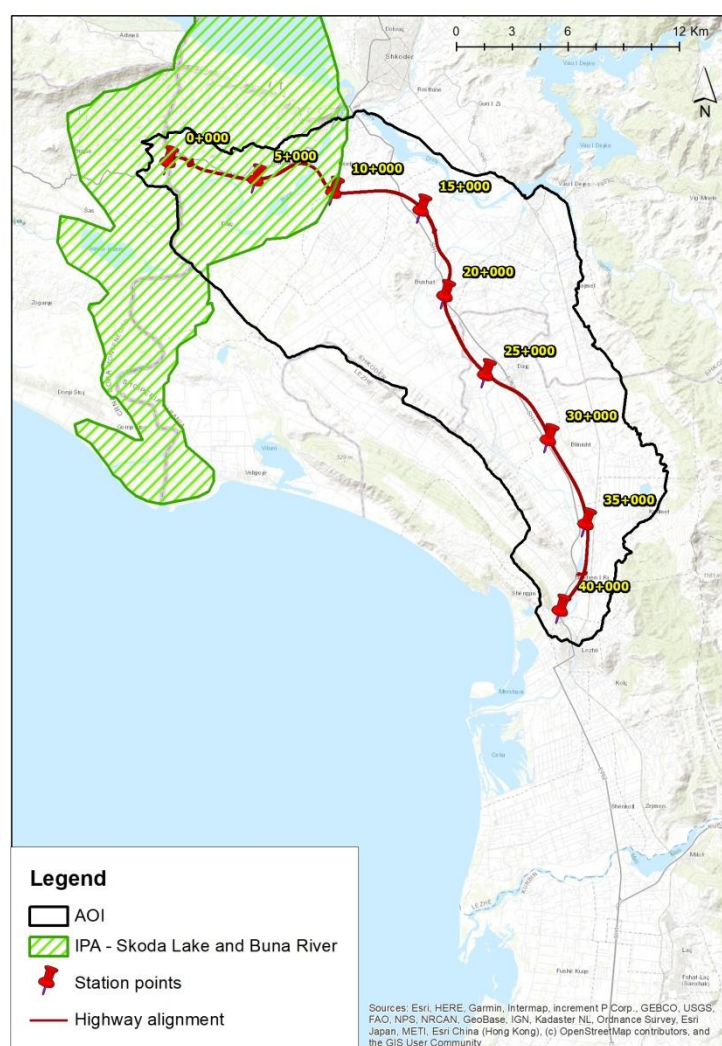


Figure 45 Important Plant Area Shkodra lake and Buna river

Lake Shkodra and River Buna are recognized as Ramsar site i.e. wetland of international importance. It covers surface of 49562 ha. The proposed area is composed by the eastern side (14.900 ha) of the biggest lake in the Balkan Peninsula (shared with Montenegro); River Buna (44 km) flowing from Lake Shkodra to the Adriatic Sea and shared with Montenegro from its middle stream up to the famous delta, which is a rare example of a real natural delta in the East Adriatic coast; coastal brackish lagoon of Viluni (390 ha) with an interesting hydrologic regime; floodplain forests, whose most important is the forest of Velipoja (a natural reserve of 694 ha); 13 km coast line with sand dunes from mouth of Buna River in west, up to Rana e Hedhun in east; alluvial island (Franz Joseph Island in Buna delta); rocky island (Shiroka Island in Shkodra Lake); freshwater marshlands; calcareous mountains (Taraboshi and Mali i Rrencit); karst formations; subterranean waters,

human-made ponds, irrigated lands etc. Besides sheltering a very rich biodiversity, the international importance of the area is linked to the connection/junction Shkodra Lake - River Buna - River Drin. Through Buna mouth, this connection ensures the migration of aquatic species (mainly fish) from Shkodra Lake to Adriatic Sea (and vice-versa), but also from Ohrid and Prespa Lakes (through connection with Drin River). The main activities are agriculture, stock raising, fishing and tourism. Shkodra, the biggest town of the area, over 2000 years old, with a very interesting history and architecture, formerly has been known as "the door of communication with the west" and "cradle of culture" of Albania .

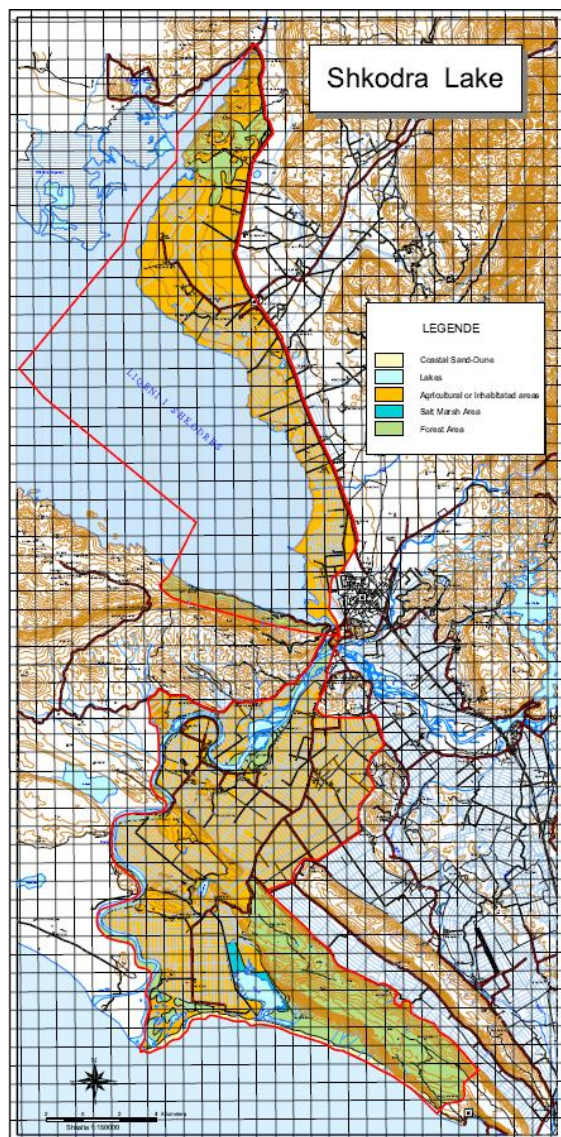


Figure 46 Ramsar site Lake Shkodra and River Buna

5.1.17 Assessment of Key Biodiversity Features (Critical Habitat – CH and Priority Biodiversity Features - PBF)

Assessment of Critical Habitat and Priority Biodiversity Features was performed according to the PR6 guidelines. The objectives of ESR6 are to protect and conserve biodiversity; maintain core ecological functions of ecosystem services and biodiversity they support; adapt the mitigation hierarchy approach; and promote the sustainable management of living natural resources through the adoption of good international practices.

EBRD ESR 6 defines critical habitats (CH) as:

- highly threatened or unique ecosystems;
- habitats of significant importance to endangered or critically endangered species
- habitats of significant importance to endemic or geographically restricted species;
- habitats supporting globally significant migratory or congregatory species;
- areas associated with key evolutionary processes; or
- ecological functions that are vital to maintaining the viability of biodiversity features described above.

Priority biodiversity features (PBF) are below critical habitat in terms of sensitivity, however, they still require careful consideration as part of the assessment and development of mitigation. They include four criteria: Criterion i - Threatened habitat, Criterion ii - Vulnerable species, Criterion iii - Significant biodiversity features identified by a broad set of stakeholders / governments and Criterion iv - Ecological functions vital to maintaining the viability of identified PBF.

For all relevant Priority Biodiversity Features and Critical Habitats an Ecologically Appropriate Assessment Area (EAAA) will be designed. It will encompass the distributions of potentially affected biodiversity features and the ecological patterns, processes, and functions that are necessary for maintaining them throughout this distribution. EAAAs extend beyond the project's physical footprint and may be wider than the project area of influence.

Key biodiversity features are presented in the following tables. There are 11 important habitats according to the EU Habitats Directive, out of which 4 should be taken into consideration during the ESIA and Critical Habitat Assessment (CHA). There are also 36 species of amphibians, reptiles and mammals that are listed with certain relevant conservation status. There are about 70 species of birds that are important according to the EU Birds Directive and/or have certain threat status. About 30 aquatic species are also considered as important – 12 fish species and 18 invertebrates. The list of these potentially important species will be further elaborated based on the confirmed presence of the species (field surveys) and assessment of the potential impacts to particular species. It is necessary to involve additional specialists for birds, mammals, amphibians and reptiles in the next phases of the project in order to perform the Critical Habitat Assessment.

An Appropriate Assessment is legally required for Critical Habitats according to EU and Albanian legislation. Hence, a ToR for additional experts will be elaborated with clear methodology for biodiversity surveys (at least one year of fieldwork) in order to obtain the necessary data for the Appropriate Assessment for these habitats. A Biodiversity Management Plan will be also elaborated based on the PR6 principles: follow mitigation hierarchy (avoidance-mitigation-compensation), enable proper management and conservation of all biodiversity components throughout project (pre-design, construction, operation), respect no-net-loss for PBFs and net-gain for CHs, detect responsibilities, include sound monitoring, etc.

Table 23 List of important habitats

EU Habitats Directive (Annex I)	Comments on potential impacts	Potential Critical Habitat
1310 Salicornia and other annuals colonising mud and sand	No impact is expected since these habitats are distributed far away from the projected motorway alignment	No
1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	No impact is expected since these habitats are distributed far away from the projected motorway alignment	No
1420 - Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)	No impact is expected since these habitats are distributed far away from the projected motorway alignment	No

EU Habitats Directive (Annex I)	Comments on potential impacts	Potential Critical Habitat
2110 Embryonic shifting dunes	No impact is expected since these habitats are distributed far away from the projected motorway alignment	No
3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation	No impact is expected since this habitat is known only for lake Skadar	No
3280 - Constantly flowing Mediterranean rivers with <i>Paspalo Agrostidion</i> species and hanging curtains of <i>Salix</i> and <i>Populus alba</i>	The projected motorway passes through some of these habitats, especially along rivers Buna, Gjader and Drini	Yes
72A0-Drainage Channels- Reed beds (<i>Phragmito-Magnocaricetea</i>)	The projected motorway passes through some of these habitats, especially near river Gjader	Yes
91F0 Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers (<i>Ulmion minoris</i>)	The projected motorway passes through some of these habitats, especially along river Buna. However, this habitat is not present at the crossings.	Yes
9250 <i>Quercus trojana</i> woods	Impacts are unlikely. No stand of <i>Quercus trojana</i> was recorded during the fieldwork.	No
92A0 - <i>Salix alba</i> and <i>Populus alba</i> galleries	The projected motorway passes through some of these habitats, especially along river Buna	Yes
92D0 Southern riparian galleries and thickets (<i>Nerio-Tamaricetea</i> and <i>Securinegion tinctoriae</i>)	No impact is expected since these habitats area distributed far away from the projected motorway alignment	No

Species	IUCN	Bern Convention	Habitats Directive Annex
<i>Lutra lutra</i>	NT	II	II, IV
<i>Martes foina</i>	LC	III	
<i>Nyctalus noctula</i>	LC	II	
<i>Oryctolagus cuniculus</i>	NT	-	
<i>Stenella coeruleoalba</i>	DD	II	
<i>Tursiops truncatus</i>	DD	II	II
<i>Meles meles</i>	LC	III	
<i>Testudo hermanni</i>	NT	II	II, IV
<i>Emys orbicularis</i>	NT	II	II, IV

Species	IUCN	Bern Convention	Habitats Directive Annex
<i>Mauremys rivulata</i>	LC	II	
<i>Caretta caretta</i>	NT	II	II, IV
<i>Podarcis muralis</i>	LC	II	IV
<i>Podarcis taurica</i>	LC	II	IV
<i>Lacerta trilineata</i>	LC	II	IV
<i>Lacerta viridis</i>	LC	II	IV
<i>Pseudopus apodus</i>	LC	II	
<i>Anguis fragilis</i>	LC	III	
<i>Natrix natrix</i>	LC	III	II, IV
<i>Natrix tessellata</i>	LC	III	IV
<i>Platycephalus najadum</i>	LC	II	
<i>Telescopus fallax</i>	LC	II	
<i>Zamenis situla</i>	LC	II	
<i>Zamenis longissimus</i>	LC	II	
<i>Elaphe quatuorelineata</i>	NT	II	
<i>Malpolon insignitus</i>	LC	II	
<i>Vipera ammodytes</i>	LC	II	IV
<i>Algyroides nigropunctatus</i>	LC	II	IV
<i>Dolichophis schmidtii</i>	LC	III	
<i>Hierophis gemonensis</i>	LC		
<i>Lacerta agilis</i>	LC	II	IV
<i>Pelophylax shqipericus</i>	EN	II	III
<i>Pelophylax kurtmuelleri</i>	LC	III	
<i>Bombina variegata</i>	LC	II	II, IV
<i>Bufo viridis</i>	LC	II	IV
<i>Hyla arborea</i>	LC	II	IV
<i>Rana graeca</i>	LC	III	IV

Table 24 List of threatened terrestrial species (excluding birds)

Species	IUCN	Bern Convention	Birds Directive Annex I
<i>Accipiter brevipes</i>	LC	II	✓
<i>Alcedo atthis</i>	LC	II	✓
<i>Anthus campestris</i>	LC	II	✓
<i>Aquila chrysaetos</i>	LC	II	✓
<i>Aquila clanga</i>	VU	II	✓

Species	IUCN	Bern Convention	Birds Directive Annex I
<i>Ardea purpurea</i>	LC	II	✓
<i>Ardeola ralloides</i>	LC	II	✓
<i>Asio flammeus</i>	LC	II	✓
<i>Aythya nyroca</i>	NT	III	✓
<i>Botaurus stellaris</i>	LC	II	✓
<i>Bubo bubo</i>	LC	II	✓
<i>Buteo rufinus</i>	LC	II	✓
<i>Calandrella brachydactyla</i>	LC	II	✓
<i>Caprimulgus europaeus</i>	LC	II	✓
<i>Charadrius alexandrinus</i>	LC	II	✓
<i>Chlidonias niger</i>	LC	II	✓
<i>Ciconia nigra</i>	LC	II	✓
<i>Circaetus gallicus</i>	LC	II	✓
<i>Circus aeruginosus</i>	LC	II	✓
<i>Circus cyaneus</i>	LC	II	✓
<i>Circus macrourus</i>	NT	II	✓
<i>Circus pygargus</i>	LC	II	✓
<i>Coracias garrulus</i>	NT	II	✓
<i>Dendrocopos syriacus</i>	LC	II	✓
<i>Egretta garzetta</i>	LC	II	✓
<i>Emberiza hortulana</i>	LC	III	✓
<i>Falco biarmicus</i>	LC	II	✓
<i>Falco columbarius</i>	LC	II	✓
<i>Falco eleonora</i>	LC	II	✓
<i>Falco peregrinus</i>	LC	II	✓
<i>Falco vespertinus</i>	NT	II	
<i>Ficedula albicollis</i>	LC	II	✓
<i>Gallinago media</i>	NT	II	✓
<i>Gavia arctica</i>	LC	II	✓
<i>Gavia stellata</i>	LC	II	✓
<i>Glareola pratincola</i>	LC	II	✓
<i>Gyps fulvus</i>	LC	II	✓
<i>Himantopus himantopus</i>	LC	II	✓
<i>Ixobrychus minutus</i>	LC	II	✓
<i>Lanius collurio</i>	LC	II	✓
<i>Lanius minor</i>	LC	II	✓
<i>Larus genei</i>	LC	II	✓

Species	IUCN	Bern Convention	Birds Directive Annex I
<i>Larus melanocephalus</i>	LC	II	✓
<i>Limosa lapponica</i>	LC	-	✓
<i>Limosa limosa</i>	NT	-	
<i>Lullula arborea</i>	LC	III	✓
<i>Melanitta fusca</i>	EN	III	
<i>Milvus migrans</i>	LC	II	✓
<i>Numenius arquata</i>	NT	III	
<i>Nycticorax nycticorax</i>	LC	II	✓
<i>Otis tarda</i>	VU	II	✓
<i>Pelecanus crispus</i>	VU	II	✓
<i>Pernis apivorus</i>	LC	II	✓
<i>Phalacrocorax aristotelis</i>	LC	II	✓
<i>Philomachus pugnax</i>	LC	-	✓
<i>Phoenicopterus ruber</i>	LC	II	✓
<i>Platalea leucorodia</i>	LC	III	✓
<i>Plegadis falcinellus</i>	LC	II	✓
<i>Pluvialis apricaria</i>	LC	III	✓
<i>Podiceps auritus</i>	LC	II	✓
<i>Porzana parva</i>	LC	II	✓
<i>Porzana porzana</i>	LC	II	✓
<i>Porzana pusilla</i>	LC	II	✓
<i>Recurvirostra avosetta</i>	LC	II	✓
<i>Sterna albifrons</i>	LC	II	✓
<i>Sterna caspia</i>	LC	-	✓
<i>Sterna hirundo</i>	LC	II	✓
<i>Sterna sandvicensis</i>	LC	II	✓
<i>Tringa glareola</i>	LC	II	✓
<i>Troglodytes troglodytes</i>	LC	II	✓
<i>Turnix sylvatica</i>	LC	II	✓

Table 25 List of bird species with great conservation importance

Species	Status	Comments
The Adriatic sturgeon (<i>Acipenser naccarii</i> Bonaparte, 1836)	CR IUCN HD: II, IV	Adriatic sturgeon historically occurred to the Buna drainage in Albania (Kottelat & Freyhof 2007). Naturally reproducing populations along the Balkan coast are believed to be extinct with the last record coming from the Buna River, Albania in 1997.
European sea sturgeon (<i>Acipenser</i>	CR IUCN HD: II, IV	Similarly to Adriatic sturgeon historically occurred to the Buna drainage in Albania (Kottelat & Freyhof 2007). Naturally

Species	Status	Comments
<i>sturio</i> Linnaeus, 1758)		reproducing populations along the Balkan coast are believed to be extinct with the last record coming from the Buna River.
European eel (<i>Anguilla anguilla</i> Linnaeus, 1758)	CR IUCN	The causes of declining recruitment are multi-variate and not entirely understood, but loss of spawning habitat and mortality during both up- and downstream migration due to dams is at least one of the main concerns.
Twait shad (<i>Alosa fallax</i> , <u>Lacepède, 1803</u>)	BC III HD: II	Following different records seems that they have become very rare in the Lake Skadar/Shkodra in Montenegro, but presence in River Buna is still satisfactory.
Ohrd spirin (<i>Alburnoides ohridanus</i> Karaman, 1928)	VU IUCN BC III	Endemic Balkans. Present in the Lake Skadar/Shkodra and Ohrid basins (Montenegro, Albania and Macedonia). It occurs in surfzone along lake shores.
Western Balkan barbel (<i>Barbus rebeli</i> Koller, 1926)	BC V	Endemic Balkans. The Western Balkan barbelis found in the Adriatic basin from Drin to upper Vjosa River. Found in Albanian rivers in the following basins; a) Drin drainage from Zeta River to Lake Ohrid; b) northern Albanian rivers from Matito Erzeni; c) Albanian rivers Shkumbin to Dukati but including Lake Prespa.. The species occurs both in lakes and streams, with overfishing potentially a problem in Albania.
Scadar nasse (<i>Chondrostoma scodrensis</i> Elvira, 1987)	Extinct	
Minow nasse (<i>Chondrostoma toxostoma</i> Karaman, 1928)	EN IUCN BC III HD: II	No records for the presence on Albanian side, but only on Montenegrin. They live in both streams and lakes, and can survive impoundment as long as wetlands and shallow shores are available
Bitterling (<i>Rhodeus amarus</i> , Bloch, 1782)	HD: II	Occurs most abundantly in still or slow-flowing water with dense aquatic vegetation and sand-silt bottom as lowland ponds, canals, slow-flowing rivers, backwaters and oxbows, where mussels are present.
Scadar gudgeon (<i>Gobio skadarensis</i> Karaman, 1937)	EN IUCN	Endemic Balkans. Its geographical home range includes Lake Shkodra, River Drini system, Vloša River, Semani River (both Devolli and Osumi). The river itself is suitable habitat for this species, but abundance rate is expected to be low.
Adriatic trout (<i>Salmo obtusirostris</i> , Heckel, 1851)	EN IUCN HD: II	Softmouth trout are the most intriguing member of the genus <i>Salmo</i> ; previously known as <i>Salmothymus</i> . Five distinct populations exist, one of them in Skadar Basin.
<i>Telestes montenegrinus</i> Vuković, 1965)	BC III HD: II	Endemic Balkans. Present in Lake Shkodra basin (Montenegro, Albania). Occurs in a wide range of habitats from small mountain streams to lake shores. Reported to feed on plankton and bottom fauna.
<i>Radomaniola elongata</i> (Radoman, 1973)	Critically endangered	This species is recorded in Lake Skadar/Shkodra, known only from its locus typicus, the spring on island of Vranjina in the Montenegrin side. Thought species has wider distribution.

Species	Status	Comments
<i>Radomaniola lacustris</i> (Radoman, 1983)	Critically endangered	Present mostly in the sprig areas located in Lake Skadar/Shkodra and firstly described on Montenegrin side of the lake. Following records <i>Radomaniola lacustris</i> inhabits the southwestern part of the lake, which is an area known to harbor many sublacustrine springs. It seems probably that these two hydrobiid species require the specific environment associated with sublacustrine springs, a patchy system of porous stones or rocks, called "litoral interlithon".
<i>Bithynia zeta</i> Glor & Pesic, 2007	Endangered	This species is considered as a most common together with <i>B. skadarski</i> among other species of this genus recorded In Lake Skadar/Shkodra, Montenegro and Albania.
<i>Bithynia skadarskii</i> Glöer & Pešić, 2007	Endangered	This species is considered as a most common together with <i>B. Zeta</i> among other species of this genus recorded In Lake Skadar/Shkodra, Montenegro and Albania.
<i>Vinodolia scutarica</i> (Radoman, 1973)	Endangered	Gastropod species located in Montenegro and Albania Lake Skadar/Shkodra drainage area.
<i>Vinodolia matjasici</i> (Bole, 1961)	Critically endangered	Gastropod species located in Montenegro and Albania Lake Skadar/Shkodra drainage area.
<i>Plagigeyeria zetaprotogona</i> Schütt, 1960	Endangered	This species has been recorded on Montenegrin side of Lake Skadar/Shkodra (Albania and Montenegro)
<i>Plagigeyeria zetaprotogona vitoja</i> Reischütz & Reischütz, 2008	Endangered	This species has been recorded on Montenegrin side of Lake Skadar/Shkodra (Albania and Montenegro)
<i>Valvata montenegrina</i> Glöer & Pešić, 2008	Endangered	This species has been recorded on both sides of Lake Skadar/Shkodra (Albania and Montenegro) and it inhabits subterranean springs located in the littoral zone of the lake.
<i>Stagnicola montenegrinus</i> Glöer and Pešić, 2009	Near threatened	Lives in emergent (<i>Phragmites communis</i>) and floating (<i>Nymphaea alba</i> , <i>Nuphar luteum</i>) vegetation in the littoral zone together with <i>G. Ioanis</i> (Lake Skadar/Shkodra)
<i>Radix skutaris</i> Glöer & Pešić, 2007	Endangered	Lives in emergent (<i>Phragmites communis</i>) and floating (<i>Nymphaea alba</i> , <i>Nuphar luteum</i>) vegetation in the littoral zone together with <i>G. Ioanis</i> (Lake Skadar/Shkodra)
<i>Gyraulus ioanis</i> Glöer & Pešić, 2007	Critically endangered	Lives in emergent (<i>Phragmites communis</i>) and floating (<i>Nymphaea alba</i> , <i>Nuphar luteum</i>) vegetation in the littoral zone together with <i>G. Shasi</i> (Lake Skadar/Shkodra)
<i>Gyraulus meierbrooki</i> Glöer & Pešić, 2007	Endangered	Lives in emergent (<i>Phragmites communis</i>) and floating (<i>Nymphaea alba</i> , <i>Nuphar luteum</i>) vegetation in the littoral zone in Skadar/Shkodra Lake
<i>Gyraulus shasi</i> Glöer & Pešić, 2007	Critically endangered	Lives in emergent (<i>Phragmites communis</i>) and floating (<i>Nymphaea alba</i> , <i>Nuphar luteum</i>) vegetation in the littoral zone together with <i>G. Ioanis</i> (Lake Skadar/Shkodra)
<i>Unio crassus</i> Philipsson, 1788	Endangered	Threatened by water pollution, drainage, regulation activities/construction of runnings waters.
<i>Unio mancus</i> Lamarck, 1819 (syn.	Near Threaten	The species is threatened by similar factors as <i>U. Crassus</i> .

Species	Status	Comments
<i>U. elongatulus</i> Pfeiffer, 1825)		
<i>Microcondylaea bonellii</i> (Ferussac, 1827)	Vulnerable	Presnet in River Gjadri, Drini and Lake Shkodra. Species is facing diferent impacts leading to population decrease.
<i>Dreissena carinata</i> (Dunker, 1853) (syn. <i>D. presbensis</i> Kobelt, 1915, <i>D. stankovici</i> Lvova and Starobogatov, 1982)	Near Threaten	Beside molecular approaches towards taxonomic status definition, there are still different interpretation on speices, but it is presnet in Lake Shkodra, and location downstraem the Vau i Dejes dam.

BC – Bern Convention, HD – Habitats Directive, IUCN – Red list of threatened species of International Union for Conservation of Nature

Table 26 List of threatened aquatic species

5.1.18 Waste management

The following section presents an overview of solid waste management practices within the project area, including collection, transport, disposal systems, and the current institutional responsibilities of the municipalities of Shkodër, Vau i Dejës, and Lezhë. Information has been updated in line with the latest data from AKM (2024) and the National Waste Management Plan 2022–2030.

The table below provides and overview of the waste generation rates in the subject municipalities, obtained as a product of the multiplication of population numbers in each pilot municipality and indicators on waste generated per capita and day (adopted from respective national waste strategies and plans)⁹.

Municipality	Population	Waste indicator (kg/cap/day)	Waste generation (tons/year)	Tourism waste (tons/year)	Total waste generation (tons/year)
Lezhe	106,245	0.43	20.730	13.500	34.230
Vau I Dejes	48,966	0.41	7.500	/	7.500
Shkoder	200,889	1.10	81.215	27.000	108.215

Table 27: Waste generation in the municipalitie of Lezhe, Vau I Dejes and Shkoder

The waste is collected by public and private operators, however they are not capable of covering the entire territory by an organised waste collection due to the lack of suitable refuse trucks and containers.

Municipality	Regular Waste Collection Frequency	Schedules during Tourist Season
Lezhe	Every Day	Three times a day
Vau I Dejes	Twice a week	Every day
Shkoder	Twice a week	Every day

⁹ SOLID WASTE MANAGEMENT In cross-border rural and coastal areas of South Eastern Europe, 2018, SWG RRD, NALAS, GIZ

Table 28: Regular Waste Collection Frequency and Schedules during the Tourist Season

Waste collection rate (service coverage) varies and spans from 70 to 80%. Low waste collection rate renders significant amounts of waste not collected and potentially dumped all over the region.

Municipality	Waste Collection Rate (%)	Waste not collected (tons/year)
Lezhe	75	5,182.5
Vau i Dejes	70	2,250
Shkoder	80	16,243
Total		23,675.5

Table 29: Waste collection rate and amounts of waste not collected in the municipalities

Municipality of Shkodër

Collection and responsibilities:

Waste management services in Shkodër Municipality are operated through public–private service contracts. The private contractor performs waste collection and transport for urban and suburban areas, excluding industrial premises, hospitals, construction/demolition debris, and abandoned vehicles, which remain under municipal or third-party responsibility. Green waste (grass and tree trimmings), bulky waste, and waste electrical and electronic equipment (WEEE) are collected periodically from designated collection points. Monitoring and supervision are undertaken by the Municipal Waste Department.

Collection and transport:

- Approximately 1,750 waste containers (1.1 m³ capacity) are in service, with collection frequency ranging from 3 to 7 times per week depending on the zone.
- Recyclable fractions (paper, plastics, metals) are separated by informal collectors and authorized private recycling operators.
- Waste collection coverage is estimated at 100 % of the urban population and about 85 % of rural administrative units.
- The total volume of communal waste collected annually is approximately 38,000 t/year, consisting mainly of household and commercial waste.

Disposal:

Collected waste is transported directly to the Bushat Landfill, located 15 km from Shkodër. The facility, operational since 2013, receives approximately 110–130 t/day. Although formally classified as a sanitary landfill, Bushat currently does not fully comply with the technical and environmental requirements of DCM No. 418/2018 (alignment with EU Landfill Directive 1999/31/EC). The site lacks adequate leachate treatment and methane recovery systems.

Municipality of Vau i Dejës

Collection and transport:

Waste collection is carried out directly by the Municipal Waste Department using 1.1 m³ containers, with a collection frequency of twice per week. Recycling or source-separation systems are not yet implemented, and no private contractor is engaged. Street sweeping and waste segregation are minimal.

Disposal:

Waste is transported to the Bushat Landfill, shared with Shkodër Municipality. The estimated daily quantity disposed is approximately 150 t/day.

Municipality of Lezhë**Collection and responsibilities:**

Solid-waste management, including collection, street cleaning, and supervision, is organized under the municipality through three private operators, covering urban and peri-urban zones. Construction and demolition (C&D) waste removal is the responsibility of construction permit holders, while bulky and WEEE waste are handled through municipal collection campaigns. Medical waste is treated by licensed private enterprises, and hazardous waste remains largely unmanaged due to lack of specialized treatment facilities.

Collection and transport / disposal:

- Collection frequency: daily in central areas, 2–3 times/week elsewhere.
- All waste types (mixed municipal and recyclables) are collected in 1.1 m³ containers under a one-bin system.
- No transfer station exists; mixed waste is transported directly to the Berzanë dumpsite, while recyclables are sent to the Sorting and Recycling Center in Lezhë.
- The average amount of waste disposed is $\approx$ 40 t/day.
- Green waste and construction debris are not separated; inert materials are often co-disposed at Berzanë.

Regional Waste Profile – Drin–Buna Basin

County	Total Municipal Waste (t/year)	Inert Waste (t/year)	Per-Capita Generation (kg/person/day)	Waste at Dumpsites (t/year)	Waste at Planned Landfills (t/year)
Dibër	58 560	14 570	0.30	52 650	—
Kukës	15 650	12 220	0.10	25 980	—
Lezhë	41 000	2 460	0.22	27 340	4 960
Shkodër	112 000	2 650	0.32	45 500	54 000

Table 28: Solid-Waste Generation in Drin–Buna Basin Counties (AKM 2024).

Despite legal transposition of EU requirements, collection, segregation, and disposal infrastructure remain inadequate. Illegal dumping sites persist near rivers, roadsides, and former inert-waste quarries, particularly around Vau i Dejës and Berdicë. Recycling rates remain below 10 %, and landfill capacity at Bushat is nearing saturation.

Landfilling

Bushat Landfill is considered as a national sanitary landfill that serves the region, hence considered as a regional landfill.



Figure 47: The Landfill in Bushat (July 2023, Boris Stipcarov)

Bushat Sanitary Landfill was built inside a fenced area of 23 ha and designed for a capacity of 1 million tons of waste to be collected from the regions of Shkodër and Lezhë. Start of operation had been in July 2011. The site provides facilities such as a weighbridge, a sorting plant, leachate and surface water treatment systems, gas collection system, as well heavy equipment, and is managed by a joint-stock company. Although constructed in accordance with national and EU landfill standards, the landfill operates with some operational challenges.

As regional landfill, Bushat serves the waste management zone Shkoder -Lezhe. Total of four transfer stations are foreseen in the zone that will transport the communal waste to the regional landfill of Bushat, according to the Sector Study Investment Demand Integrated Solid Waste Management (Masterplan). Improvements of the Bushat landfill are foreseen in order to provide compliance that will include: improvement in treatment, environment efficiency, leachate treatment, and gas capture and extension of the surface.

Inert Waste

Management of inert waste (C&D materials) is fragmented. Municipalities of Shkodër, Lezhë, and Vau i Dejës currently dispose of inert waste at the Bushat Landfill as a temporary measure pending identification of a dedicated inert-waste site. Stockpiles of unprocessed inert material are visible along construction corridors and abandoned quarries. A regional plan for inert-waste reuse (backfilling and road sub-base) is under preparation within the Integrated Waste Management Plan for the Northern Region (2024–2030).

Hazardous Waste

Albania has a limited national framework for hazardous-waste collection and treatment. Although several private companies are licensed for handling hazardous waste (mainly medical, oily residues, and contaminated packaging), there is no regional treatment facility within the Drin–Buna basin. Municipalities generally lack contractual arrangements with licensed operators; hazardous waste from small industries and healthcare facilities is therefore often mixed with municipal waste or stored improperly.

A National Hazardous Waste Management Centre is planned under the EU-funded “Circular Economy Transition” initiative (2025–2028), which aims to establish a centralized treatment and storage facility near Elbasan.

Key Observations

- Waste-management systems in the Drin–Buna region remain underdeveloped, characterized by partial service coverage, inadequate separation, and overloaded disposal facilities.
- Bushat Landfill requires urgent rehabilitation or replacement to meet sanitary-landfill standards.
- Illegal dumping continues to affect watercourses and wetlands.
- Institutional coordination among municipalities, AKUM, and the Ministry of Environment must be strengthened to improve compliance with EU Waste Framework objectives for 2030.

5.2 Social Baseline in the Project Area

5.2.1 Methodology for collection of relevant social data

The proposed project has the potential to affect the living of the local population and communities where the motorway will pass, thus initiating a need for land acquisition and other types of resettlements and causing potential disruption of life during project phases.

The description of baseline conditions will be prepared following thorough analyses of the social aspects along the alignment of the projected motorway, covering the municipalities of Shkoder, Vau i Dejës, and Lezhe, as well as the wider surroundings where project activities will take place. This will include both desk-based research and field investigations.

In accordance with the EBRD ESP 2024 requirements, the resettlement planning process will incorporate a comprehensive asset inventory and a socio-economic census of all affected households and businesses. These measures are essential to establish an accurate baseline of physical and economic displacement impacts.

Primary data collection will be conducted through site visits and direct engagement with potentially affected people. This will not only document social behaviour and community dynamics but also identify potential risks, vulnerabilities, and impacts.

Furthermore, livelihood restoration measures will be designed to go beyond cash compensation, ensuring that affected persons are able to restore — and ideally improve — their living standards and income-generating capacity. Measures may include targeted support for employment, skills training, access to credit, and assistance in re-establishing businesses or agricultural activities, tailored to the needs of vulnerable groups.

In order to gather as much useful data as possible an extensive and thorough data collection process will be undertaken. Secondary data will be gathered through already available sources such as the official censuses and databases in possession of the state Statistical office of the Republic of Albania, as well as available latest data sources such as the administration of affected municipalities. Data from pre-existing studies and resources already published online and available for public use, will be consulted and referenced.

Highly relevant information that will facilitate the project design will be collected during the iterative process of stakeholder engagement performed via formal and non-formal consultation meetings with representatives of various stakeholders:

- Local authorities;
- National authorities (ministries and agencies);
- Residents living in settlements in the project area and those found on site;
- Business operating in the area.

Relevant social data will also help in the creation of a solid base for further analysis of the social baseline condition of the project area and, accordingly in addressing appropriate mitigation measures to the adverse impacts generated by this project. More specifically, the data in scope will be:

- Current condition of infrastructure (local roads, water supply, electricity, waste water and waste management);
- Housing quality and density of population;
- Living conditions in the affected settlement (way of life);

- Identifying other life habits and cultural values;
- Identifying economic habits and conditions that cannot be found in relevant documents.

5.2.2 Administrative Organization in the Project Area

The project footprint is located across the territories of three municipalities in the Republic of Albania: Shkoder, Vau I Dejes and Lezhe, and two Counties: Shkodra and Lezhe. Municipality Vau I Dejes belongs to the Shkoder County.

5.2.3 Population and Settlements

The study area within the alignment (defined for the purpose of this appraisal as 100 metres wide corridor) will be used to identify potential resettlement issues in regard to the private assets (residential or other properties, development land, agricultural land or other local businesses and facilities). These assets are containing land required to accommodate the project elements during construction and/or operation.

The study area for community facilities is extended to 500 metres around the project to include public community resources (schools, religious temples, cemeteries, etc.). Community facilities within the study area are considered as potentially directly affected due to the potential for noise and vibration and air quality effects arising from project activities to impact on the health of users of these facilities. In addition, changes to the accessibility of community facilities due to changes in traffic levels and potential diversions during and after construction are of relevance.

The study area for 'community severance' is extended to 1,500 metres around the project to include settlements that may be potentially directly or indirectly affected by the project (e.g. through severance caused by the new motorway).

The projected alignment will pass through and in vicinity to a number of inhabited rural settlements presented on the table below.

Municipality	Settlement	Population (Census 2011)	Approximative distance from the motorway (in m)
Shkodra	Shtuf	191	750
	Muriqan	1229	250
	Obot	672	600
	Oblike	2749	300
	Berdice e Madhe	1663	1,100
	Mali Hebjaj	726	650
	Beltoje	775	800
	Berdice e Poshtme	No data	850
	Zus	No data	1,000
	Velinaj	No data	1,200
	Gorice	No data	1,100
	Dodaj	No data	200
Vau i Dejes	Ashte	999	800
	Kosmac	2332	800

Municipality	Settlement	Population (Census 2011)	Approximative distance from the motorway (in m)
	Meglushe	2533	1,300
	Plezhe	743	50
	Shkjeze	1116	350
Lezhe	Mabe	1020	850
	Dajc	1677	800
	Barbullush	No data	1,400
	Guradec	No data	1,300
	Kodhel	No data	1,300
	Gocaj	No data	750
	Piraj	558	200
	Blinisht	996	750
	Rraboshte	1700	900
	Merqi	1200	900
	Balldren I Ri	1054	50
	Balldren	2465	400

Table 30 General demographic overview of the affected settlements

Main demographic problem in the project area of influence is the decrease of population (depopulation) as a result of rural-urban migration, particularly internal (youth is migrating to Tirana) and abroad (Western Europe). Since the last census (2011) information has been shared by the responsible local authorities on the process of depopulation of the project area.

5.2.4 Distribution of Properties

The project area of Influence is stretching through arable land used by the local farmers who reside in the rural settlements stretched on both sides of planned motorway section. Although not all parcels are used in extensive and regular agriculture production, however land still represents valuable asset that provides livelihood to the local population. As one of the main pillars of income in the households in all three municipalities, the fields are used mainly for forage followed by cereals production.

In 2020, in the municipality of Shkodra, some 61% of the arable land was planted with forage. Similar situation with present plants on the arable land is both other municipalities: Lezhe (60%) and Vau i Dejes (56%). Cereals are most present in the municipality of Vau i Dejes (33% of the arable land), followed by Lezhe (29%) and Shkoder (21%). Highest share of arable land under Vegetable is in the municipality of Shkoder (13%), followed by Vau i Dejes (9%) and Lezhe (7%). In municipality of Shkodra arable land is used for growing tobacco (1%), white beans (2%) and Patatoes (2%) , while in the municipality of Lezhe white bean is present on 3% of the arable land and potato is grown on 2% of the arable land. In Vau i Dejes white bean is present on 2% of the arable land, while Potato is present on 1% of the arable land in the municipality.

Maize is the most present plant on the fields under cereals in municipality of Lezhe (84%) and Vau I Dejes (78.5%).

Regarding the livestock, the municipality of Lezhe holds $\frac{1}{4}$ share of all pigs in Albania, and these three municipalities, altogether hold 39% of all pigs in the country. Similar is with beehives where all three municipalities hold 16% of all registered beehives in the country with largest share of 11% is in Shkodra. Some 9% of all cattle in the country is registered in these three municipalities (cumulative).

About 60% of population of these three municipalities lives in countryside and deals mostly with agriculture which is still sector that remains undeveloped without any effective management systems implemented.

The economy in the project affected municipalities, besides agriculture and animal husbandry, also relies on few industries that are still active since the 90's. City of Lezhe was previously known for various industries such as wood, paper, building materials (bricks, tiles, etc.) as well as the food industry (fish processing), and now only fish processing remains as an active industry. Today the economy in the city is diversify and rely on trade, services and industry as sectors that employ the largest number of residents.

There is an Industrial zone of Lezhe but it is out of order and no business activity is exercised in it. The port of Shengjin and costal touristic amenities that belong to this municipality, represent strong support for its economy.

Similar is with the city of Shkodra, where economy relies on trade and service and tourism, beside agricultural production.

The territory of the municipality of Vau i Dejes is diverse, with a mainly plain relief in the southwestern part and mountainous in the north-eastern part. Agricultural potentials, tourism and handicrafts, are the main pillars of municipality's development. The economy is mostly rural. Agriculture plays the primary role with 65-85% of employment. The presence of energy infrastructure (presence of 4 HPPs) also plays an important role employs over 5% of the workforce.

The municipality of Vau-Dejes is also, rich in natural resources with estimated large number of metal deposits (copper, mercury) and non-metals (magnesium, clay, dolomite, etc.). In addition to the exploitation of mines, the Municipality of Vau-Dejes has several exploratory mines used for exploitation of minerals.

5.2.5 Economy and Livelihood

The project alignment significantly avoids directly affecting populated dwelling objects, although there are few that are expected to be affected (up to 10) homes, and households to be resettled. These properties are located mainly in Balldren, at the very end of the motorway section. The following image gives overview of potential dwelling objects that will be resettled (yellow pins).



Figure 48 Potential houses to be resettled (pins in yellow)

There are several locations where auxiliary properties (barns, garages, storage places, stables, green gardens) must be acquired. These are located in the following settlements: Murriqan, Oblike, Gocaj, Plezhe, Balldren.

Some industrial facilities are to be acquired, but these facilities are generally providing services, so there is no production facility expected to be affected. Two small car-repair workshops must be acquired - near the military airfield, on the road toward the Kodhel village, and Balldren. No other industrial objects are foreseen to be acquired.

This motorway section intersects the main road SH1 (E762) Tirana- Shkodra on four locations, road SH28 on 1 location, same as the road SH27 and the road SH41 (E851) that leads toward the border with Montenegro.

The project footprint goes across numerous local roads that are connecting the villages with the main road and with fields.

The project footprint stretches over arable fields and some orchards. Due to the presence of these fields an extensive irrigation network was being built throughout the decades.

At this moment, project design registers 2042 potentially affected parcels. The Project will prepare RP and provide complete inventory of affected assets and persons (Census and Asset Inventory)

5.2.6 Cultural Heritage

Albania is home to a number of landmarks with valuable cultural and historical importance.

Protection and preservation of cultural heritage is ensured by the coordination of work between the State Central Authorities and Local Self-government Units. The responsible ministry for cultural heritage carries the functions for conservation, protection, assessment and management of cultural assets. Local self-government units cooperate with the responsible Ministry of Culture to carries out the functions of preservation and protection of cultural assets.

Other Specialized institutions in the field of cultural heritage are:

- National Institute of Cultural Heritage;
- National Institute for the Registration of Cultural Heritage;
- Regional Directorates of Cultural Heritage;
- The National Centre for Traditional Activities;
- Institutions of National Archive Network;
- The National Library of Albania;
- Institute of Cultural Anthropology and Study of Art;
- Institute of Archaeology.

The following presents the number of protected cultural heritage elements, consistent with the national registers, in all three municipalities, separately.

Municipality	Monuments of Category I	Monuments of Category II
Shkodra	117	11
Vau i Dejes	12	1
Lezhe	16	1

Table 31 Protected Cultural Heritage in the project affected municipalities

In the municipalities Shkoder and Vau i Dejes, there are no archaeological sites that are close to the project footprint. All archaeological sites in these two municipalities are at a safe distance from the motorway alignment.

In the municipality of Lezhe, there are three archaeological sites in proximity to the project area, and these are "The Shkina Bridge" (Urre e Shkines), "The Catholic Church St. Prena – St. Vrenda" (Kisha e Shen Premtes ne Balldren) and "The ruins of the Bridge Plakagjon" (Rrenojat e Urres te Plakagjonit Rraboshte. All three sites are of Category I. The following image gives provisional location of first two archaeological sites.

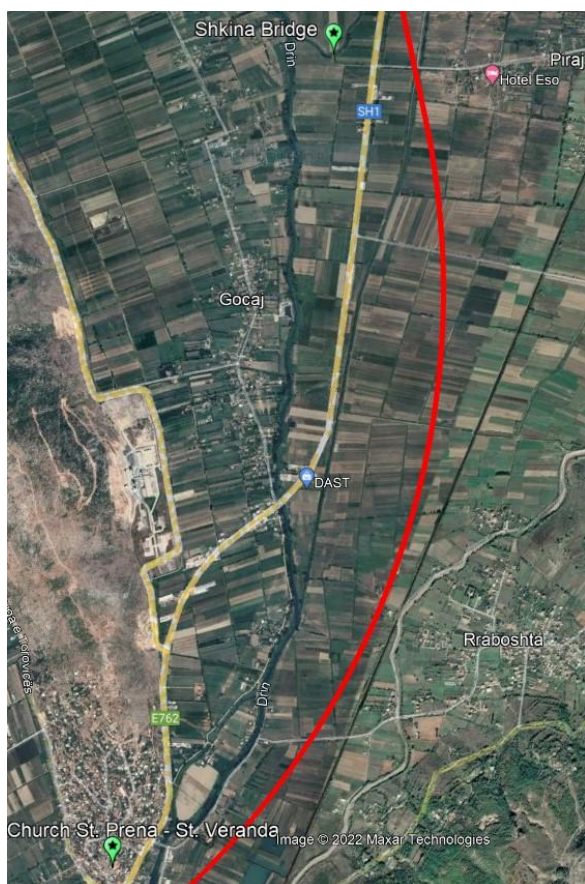


Figure 49 Provisional location of first two archaeological sites

5.2.7 Information Disclosure and Stakeholder Engagement

The proposed project has a wide range of stakeholders (including statutory consultees, local communities, businesses, farmers, landowners, and other affected groups) with differing interests that will require varied levels of information.

Stakeholders have been involved from the beginning of the planning phase for this project. The Project was developed during the Feasibility stage WB14-REG-TRA-01 (WBIF - IPF5, 2019) and in communication with all relevant institutional stakeholders and comprehensive stakeholder engagement activities it was brought to certain advanced condition during the Preliminary design stage WB24-ALB-TRA-01 (WBIF-IPF10, 2024).

Early in 2022 year (March and April), there were meetings in person with institutional stakeholders that are related to protection of environment and nature. Meetings continued with project presentation activities to the Municipality's representatives, and all three municipalities were communicated and interacted directly, in their premises.

After conclusion of the E&S Scoping Report under IPF10, and prior to commencement of social survey, a set of three public Project presentation events was organized and conducted. Three public Project presentations were held on 30 and 31st March 2023 in the premises of all three Municipalities. The public Project presentation/information disclosure event was promoted/advertised on the websites of the Municipalities.

Carefully tailored socio-economic survey for the needs of social baseline, took place in May-July 2023. This thorough socioeconomic survey for the ESIA baseline purposes was conducted in the settlements being part of Project area of influence (PAI), on a sample of 209 questionnaires, that is 0.333% of total number of households in all three municipalities, according to the 2011 Population and Households Census. It also places special focus on the households located within the proposed expropriation lines (or next to it if refusal for cooperation occurs). Information on the survey was distributed by the Municipalities on their own website and

information was shared at the Project Presentation events in end March 2023. All respondents were informed on the motorway project, purpose of the survey and project elements prior to start of fulfilment of the questionnaire.

After completing the Environmental and Social Impact Assessment report (ESIA), Stakeholder Engagement Plan (SEP), Resettlement Framework (RF), Non-Technical Summary (NTS), Environmental and Social Action Plan (ESAP), Environmental and Social Management Plan (ESMP) and Biodiversity Management Plan and disclosure of the NTS on the MIE website, four public consultation meetings with relevant stakeholders were organized/facilitated by MIE. These four public consultation events were held on 20 and 21st May 2024 in the respective premises of the three Municipalities (Lezhe, Shkoder and Vau I Dejes), while the event in Tirana was held in the premises of the Ministry of Infrastructure and Energy. The event of presentation of ESIA findings / consultation was promoted/advertised on the websites of the Municipalities.

6 Consultation and participation arrangements

Effective stakeholder engagement and consultation is fundamental to the success of the proposed road project. The project involves a wide range of stakeholders (including statutory consultees, local communities, businesses, encroachers, and other affected groups) with differing interests that will require varied levels of information.

In accordance with the EBRD ESP 2024 updates, stakeholder engagement will be conducted in a gender-sensitive and disability-accessible manner, ensuring that all groups are able to participate meaningfully. Information disclosure and feedback will be facilitated through digital platforms (such as project websites and online repositories) alongside traditional methods, to maximize accessibility and inclusivity.

Furthermore, the project will establish a grievance mechanism that is both digital and accessible, enabling stakeholders to submit concerns or feedback online, while also providing non-digital options for those with limited internet access. This dual approach ensures that the grievance process is transparent, responsive, and inclusive of vulnerable and disadvantaged groups.

6.1 Previous consultation

As part of the preliminary design phase, in 2022 year (March and April), introductory in person meetings were conducted with institutional stakeholders to inform about the project activity and establish communication. Meetings continued with project introductory activities to the Municipality's representatives, and all three municipalities were communicated and interacted directly, in their premises.

After conclusion of the E&S Scoping Report and prior to commencement of social survey, a set of three public Project presentation events was organized and conducted. Three public Project presentations were held on 30 and 31st March 2023 in the premises of all three Municipalities.

Carefully tailored socio-economic survey for the needs of social baseline, took place in May-July 2023. This thorough socioeconomic survey for the ESIA baseline purposes was conducted in the settlements being part of Project area of influence (PAI), on a sample of 205 questionnaires.

After completing the ESIA Package, four public consultation meetings with relevant stakeholders were organized facilitated by MIE held on 20 and 21st May 2024 in the respective premises of the three Municipalities (Lezha, Shkoder and Vau I Dejes) and one in Tirana.

In addition, numerous individual meetings and communication iterations were performed by ARA and design team in order to obtain relevant data for the selection of project options and later during collection of relevant opinions by the responsible institutions for the preliminary design.

6.2 Information Disclosure and Stakeholder Engagement

A Stakeholder Engagement Plan has been prepared in the previous stage as a standalone document and part of the Project ESIA package. The purpose of this Stakeholder Engagement Plan is to design the strategy for communication and engagement with the project stakeholders. It has an objective to ensure wide information and consultation processes, proper information of all stakeholders as well as their sound engagement.

As part of the ongoing ESIA update assignment, stakeholder engagement activities will continue to ensure transparency, legitimacy, and social acceptance of a project while improving the quality of environmental and social outcomes.

Stakeholder engagement for this project will be based on the following principles:

- Early and on-going engagement with relevant stakeholders and public to inform and influence the proposed project development process;
- Seeking an appropriate level of feedback at each development stage in order to achieve iterative design process by ensuring that comments and concerns received are taken into consideration.
- Update local knowledge, concerns, and expectations.
- Understand the needs of particular individuals and groups, particularly vulnerable groups.
- Building of long-term relationships with key stakeholders throughout the different stages of the proposed project to help better understand their views;
- Where possible and practicable ensuring concerns are addressed; and
- Ensuring appropriate statutory consultation is undertaken in compliance with national requirements and best international practice.

MIE/ARA intends to implement the project as an example of good practice in the development of transport infrastructure with the aim of involving stakeholders and maintaining good communication practices throughout the life cycle of the project. Therefore, stakeholder engagement process is initiated in early project's stage and will be further carried on based on the technical analysis and environmental and social appraisal performed so far. This process will be guided by the updated Stakeholder Engagement Plan (SEP) to meet EBRD 2024 requirements.

Now, at this Detail Design stage, stakeholder engagement activities will be conducted with local population, businesses, and non-institutional stakeholders, as well. Communication with institutional stakeholders will continue on a daily and regular basis. In addition, stakeholders that will lose property and/or livelihood will be contacted during preparation and disclosure of the resettlement related documentation.

The Scoping Report will be subject to consultation in accordance with the EU EIA Directive and EBRD Environment and Social Requirements (ESR1 & ESR10). It will also be publicly disclosed, ensuring compliance with both national and EU regulations regarding stakeholder engagement in the ESIA process.

A series of public disclosure and ESIA presentation events will be organized in Tirana, Lezhe, Shkoder and Vau i Dejes, in order to make available relevant E&S project information to all stakeholders. Relevant institutional stakeholders, public enterprises and organizations will be directly invited to these meetings, while general public will be invited through the available media and internet information spots, such as social media, websites of affected municipalities and web information portals.

7 Identification of information gaps

As part of the scoping phase, significant efforts were made to identify and collect available relevant baseline data and to identify any potential gaps within the baseline information that may need to be supplemented with additional surveys to ensure assessment in compliance with PR6 and EU requirements.

Additional environmental, biodiversity and social survey should be carried out in the next phase of this ESIA.

The objective of this activity is to provide sufficient data for critical assessment of the social and environmental baseline data as part of the ESIA and to ensure it is robust enough to inform Project design decisions.

7.1 Air quality

The ambient air quality survey conducted as part of the previous ESIA provided a robust dataset that, together with the available national monitoring results, forms a solid baseline for assessing air quality conditions. In addition, ambient air impact modelling is considered to predict the dispersion of PM₁₀, PM_{2.5} and NO_x pollutants generated by traffic and their potential effects on the surrounding environment. Collectively, these data sources should be sufficient to support a comprehensive air quality impact assessment and inform the identification of appropriate mitigation measures.

The specific objective of the modelling exercise is to quantify project-attributable ambient air concentrations at sensitive receptors arising from road traffic emissions during operation, assess compliance against applicable standards (national/EU/WHO/lender), and define mitigation/monitoring where exceedances or material deterioration are predicted.

Following traffic related pollutants should be subject of the modelling: NO₂ / Nox, PM₁₀ and PM_{2.5}. The modelling shall consider the following averaging periods at minimum: a) Annual mean (NO₂, PM_{2.5}, PM₁₀), b) Daily 24-hr (PM₁₀, PM_{2.5}), and c) Hourly (NO₂). The modelling shall refer to the opening year (year 1 of operation) and also consider a period of 10 years of operation.

Terms of references has been prepared for providing Ambient Air Impact Modelling related to Transport Emissions (Annex 4).

7.2 Climate change

Following up on the Climate risk vulnerability assessment (CRVA) of the Murriqan/Sukobin - Lezhë (Balldren) motorway conducted in the previous stage and based on the findings, Climate Resilience assessment (CRA) shall be conducted. The aim of the CRA is to assess the Project's exposure and vulnerability to relevant physical climate risks and to define proportionate and cost-effective resilience measures. These measures are intended to climate-proof the road infrastructure, reduce the likelihood and consequences of climate-related disruptions, and ensure reliable operation and maintenance under future climate conditions consistent with the Project's design life.

7.3 Noise

The ambient noise survey conducted as part of the previous ESIA provided a robust dataset which, together with the available national monitoring results, establishes a solid baseline for assessing ambient noise conditions. No changes are anticipated in the traffic forecast, hence no update of the ambient noise model is necessary.

7.4 Biodiversity

The field research in previous phase resulted in qualitative data about presence of important species (mammals, birds, reptiles, amphibians, fish and aquatic invertebrates) and habitats that qualify for Key Biodiversity Features (Critical Habitats and Priority Biodiversity Features). However, other aspects are missing: exact distribution of these biodiversity components in the Area of Interest, seasonality (all four seasons will be covered), population estimates based on suitable methodology, estimation of the Ecologically Appropriate Area of Analysis (EAAA), etc. Another aspect that has to be taken in the account are the constant changes in infrastructure and human activities in the area. An engagement of additional specialists for mammals, birds and herpetofauna should be envisaged within the project with the aim to study the aforementioned aspects in four different seasons. All of this information will enable more accurate assessment of the impacts and design of sound mitigation measures as well as Appropriate Assessment. All of this should provide a sufficient dataset to inform the update of the Biodiversity Management Plan.

Visual aspects of the landscapes should be studied in detail in relation to the updated design of the highway. The landscape fragmentation effect on important habitats (with emphasis on riverine one) is not studied at necessary level.

Terms of reference has been prepared for conducting Biodiversity surveys (Annex 5).

7.5 Social and economic aspects

Relevant official social statistics for the affected municipalities are currently unavailable due to changes in the country's territorial division introduced in 2015. These data must be obtained directly through communication with the respective municipalities and local branches of governmental agencies and institutions, rather than relying solely on secondary sources.

Although a socio-economic survey conducted during the Preliminary Design stage provided valuable insights into the current social and economic conditions in the project's area of influence, continuous monitoring remains necessary. This is due to ongoing changes in land use within the area designated for motorway construction—such as increased agricultural activity, the construction of new structures, and the expansion of existing businesses.

A thorough investigation of the project's area of influence is required to assess potential adverse impacts during construction. These may include loss of livelihood, restricted access to irrigation facilities, and other direct consequences of motorway development. Such investigations will be conducted during the Resettlement Planning phase of the Detailed Design stage.

This stage will define the final project footprint in detail, including the expropriation line and the specific properties to be affected. Understanding the exact extent of resettlement-related impacts and the magnitude of physical displacement will enable the preparation of an inclusive Resettlement Plan (RP). The RP will address not only property owners but also property users.

Resettlement activities and the corresponding RP must be completed promptly upon finalization of the Detailed Design, thereby facilitating the completion of the updated Environmental and Social Impact Assessment (ESIA). While some RP-related activities may proceed in parallel with the Detailed Design process, the final RP can only be delivered once the final footprint is available and official property valuations (conducted by certified valuers) are completed and integrated into the RP document. If these data are not yet available, a preliminary version of the RP may be prepared. This version will include, to the greatest extent possible, the RP components, excluding the complete census of affected persons. The census must be finalized once valuations are complete.

Once the project design reaches the Detailed Design stage and official information on land acquisition impacts becomes available, the RP will be developed based on a comprehensive socio-economic survey. This will be accompanied by a livelihood restoration assessment and must be completed prior to the commencement of any construction activities. The RP will be prepared as a standalone document, in accordance with applicable legal provisions on expropriation and property/loss valuation.

Additionally, longstanding issues related to land ownership—stemming from historical gaps in the records maintained by the State Cadastral Agency (ASHK)—may hinder the timely implementation of the RP within the ESIA timeline. The provision of a complete list of affected parcel owners, along with official property valuations, will be critical to ensuring the timely delivery of the Resettlement Plan.

It should be noted that the locations and details of certain auxiliary works—such as construction access roads, site compounds, workers' camps, and material storage areas—might be difficult to be fully identified at this stage. It is assumed that these facilities will be located outside sensitive areas. In such case, if additional land acquisition becomes necessary, a Supplementary Resettlement Plan may be required following the implementation of the main resettlement process.

Terms of references has been prepared for providing Resettlement plan assistance (Annex 6).

7.6 Institutional capacity

As part of the ESIA update, rapid capacity assessment shall be done to evaluate the institutional, technical, and human resource capacity of the project owner and relevant implementing entities to effectively manage environmental and social risks and impacts in line with EBRD Environmental and Social Policy requirements, and to identify any capacity gaps requiring targeted strengthening measures to ensure effective implementation, monitoring, and reporting throughout the project lifecycle.

8 Assessment methodology

8.1 Methodology for assessment of impacts

The Environmental and Social Impact Assessment identifies the environmental and social impacts that may arise due to the project implementation during different stages: pre-construction, construction, operation and decommission.

The pre-construction phase includes activities for preparation of project documentation and plans, as well as providing the necessary permits/contracting that will enable a proper project implementation. In the ESIA study in details will be elaborated what type of plans needs to be prepared with elaboration of the content of each plan.

The construction phase involves the preparation/clearing of the project area and the performance of construction activities for the motorway and other associated infrastructure.

The operation of the motorway includes the activities for motorway operation, its regular maintenance, repair and needed reconstruction. The impacts that may arise due to these activities will be subject of analysis in the operational phase.

The decommission phase causes environmental and social impacts similar to those in the construction phase due to the similar activities that are expected to be carried out during the decommissioning (demolition, clearing, transport of materials and waste etc.). Due to the long-life cycle of this type of projects, currently it is not possible to predict the manner of decommissioning of the motorway; therefore, these impacts are not subject of analysis.

The assessment will characterize potential future adverse impacts associated with the project, identify potential improvement opportunities, and recommend any measures needed to avoid, or where avoidance is not possible, minimize and mitigate adverse impacts. The assessment will be conducted following the criteria given in the table below.

Criteria	Assessment	Description
Impact nature	Positive	Impact which is considered to help improve the baseline scenario or introduce positive change
	Negative	Impact which is considered to cause negative change or introduce undesired effects to the baseline scenario
Type	Direct	Impact which is a result of a direct interaction between the project activities and the resource/receptor
	Indirect	Impact which is a result of an activity which is not directly linked to the project, but occurs as a project consequence

Criteria	Assessment	Description
	Cumulative	Impact which is a result of numerous environmental and social impacts on a receptor or effects which are the result of combined effects and special developmental projects being implemented in the immediate vicinity
Time of appearance	Immediate	The impact is evident immediately and follows the project activities
	Delayed	The impacts are evident after a certain time interval and often appear after the completion of project activities
Scope	Location	The impact effects may be felt within the frames or in the immediate vicinity of 100 m from the project area
	Local	The impact effects may be felt within the frames or in the immediate vicinity of 1 km from the project area
	Area	The impact effects may be felt in the radius of 1 km to 10 km from the project area
	Regional	The impact effects may be felt in the radius of 10 km to 50 km from the project area
	National	The impact effects may be felt in the radius of over 50 km from the project area
	Cross border	The impact effects may be felt across the border of a neighbouring country
Probability	Certain	The impact will definitely occur during normal working conditions
	Highly likely	It is highly likely that the impact will occur during normal working conditions
	Likely	There is a likelihood that an impact may occur during normal working conditions
	Unlikely	It is unlikely that an impact may occur, but sometimes it may occur during normal working conditions
Duration	Temporary	It is estimated that the impact will have a duration shorter than the construction duration and/or will have a temporary character
	Short-term	Impact estimated to last only during construction phase
	Medium-term	Impact estimated to last even after construction
	Long-term	The impact and its effects will continue and will last during the whole operational phase of the project
Size/Magnitude	Negligible negative	No changes of the analysed specific baseline scenario have been registered
	Negligible positive	Very small positive benefit on the analysed specific baseline scenario have been registered
	Minor negative	Minor negative changes of the analysed specific baseline scenario have been registered

Criteria	Assessment	Description
	Minor positive	Minor positive changes and benefits of the analysed specific baseline scenario have been registered
	Moderate negative	A change in the analysed specific baseline scenario has been registered, resulting in non-fundamental temporary or permanent changes
	Moderate positive	Positive change in the analysed specific baseline scenario has been registered, resulting in fundamental temporary or permanent benefit
	Large negative	A fundamental change in the analysed specific baseline scenario resulting in a long-term or permanent change, therefore requiring significant interventions in order to be returned to the baseline scenario; surpassing national standards and borders
	Large positive	A fundamental positive change in the analysed specific baseline scenario resulting in a long-term or permanent benefit, surpassing national standards and borders
Reversibility	Reversible	The potential impact is temporary and reversible
	Irreversible	The potential impact is constant and irreversible
Sensitivity	Negligible	Very low importance and rarity, local scale
	Minor	Minor importance and rarity, local scale
	Moderate	Moderate importance and rarity, regional scale, limited potential for substitution
	Large	Large importance and rarity, national scale, and limited potential for substitution

Table 32 : Environmental and social impacts assessment criteria

Significance of impacts

The significance of the impacts has been performed using a matrix based on the magnitude/size of the impact and the sensitivity of the impact on the identified receptors. In addition is presented the matrix for evaluation of the impact significance which will be used in the process of assessment.

		MAGNITUDE			
		Negligible	Minor	Moderate	Large
SENSITIVITY	Negligible	Negligible	Negligible	Negligible	Moderate
	Minor	Negligible	Moderate	Moderate	Major
	Moderate	Moderate	Moderate	Major	Significant
	Large	Moderate	Major	Significant	Significant

Table 33 Matrix for evaluation of the impact significance

Four categories of impact significance have been identified in order to assess the impact significance from construction and operation activities. The description of each category of impact significance is presented in the following table.

Category of impact significance	
Negligible/Small	The disturbance of the environment, species and habitats in the short-term is localized and reversible. Consequences do appear; however, the impact is very minor (mitigated and unmitigated) and is within the allowed standards or the receptors are characterized with low sensitivity or value.
Moderate	The impact on the environment, species and habitats is short-term or medium-term. The ecosystem integrity will not be negatively affected in the long-term, however, there is a probability that the effects on specific species or receptors to be short-term or medium-term. The area/region will be able to recover through natural regeneration and renewal. The impact can be characterized with a broad scope, starting just above the border value of negligible impact, ending on a level which almost surpasses legal limits. If it is possible, mitigation measures should be undertaken.
Major	The impact on the environment, species and habitats (for example, during the project lifespan) can significantly and in long-term change the ecosystems and natural resources, on a local and regional level, and can impact sustainability. Returning them to the baseline scenario cannot happen without an intervention. The long-term impacts on environmental media and conditions may cause irreversible local and regional effects.
Significant	Impact of major importance is one that exceeds permissible limits and standards, or is of major importance to highly valued/sensitive resources.

Table 34 Description of each category of impact significance

Criteria for assessing possible social impacts take slightly different approach from the criteria assessing environmental impacts.

The Social Impact Assessment Approach (SIA) follows the standard procedure of the established international practice for assessing social impacts: a description of the current social environment (taken as a starting point), reviewing the changes in that social environment caused by the Project, determining the significance of those impacts and address appropriate mitigation measures.

The methodology for assessment of social impact depends on the significance of the potential social impacts. Determining the significance of impacts relies on a reasonable argument, a professional judgment, and consideration of the views and considerations of the respective organizations.

Significance is considered as a function of the magnitude of the impact and the likelihood of its occurrence. The significance matrix is described in the following table.

SIGNIFICANCE = Magnitude x Probability		PROBABILITY		
		Unlikely	Probably	Certain
MAGNITUDE	Negligible	Negligible	Negligible	Negligible
	Minor	Negligible	Low	Low
	Moderate	Low	Medium	Medium

SIGNIFICANCE = Magnitude x Probability		PROBABILITY		
		Unlikely	Probably	Certain
	Large	Medium	High	High

Table 35 Matrix for determination of significance of social impacts

Since all the social impacts considered in this study are not always negative, but have influences that are favourable to the local or wider community and to affected groups, the next colour coding is created to offer assistance in visual identification of the impacts that this project will cause.

Negative significance	Positive significance
Negligible	Negligible
Low	Low
Medium	Medium
High	High

Table 36 Colour of Significance coding of social impacts

As a result of the foreseen project activities for construction of the motorway, impacts (positive and negative) on the environment and social environment are expected. In order to determinate the magnitude and the intensity of each impact in the correspondences area and media, assessment for each activity will be conducted. In order to conduct appropriate environmental and social assessment the following criteria will be taken into consideration:

- Applicable environmental and social laws and regulatory requirements
- Relevant climate change aspects (vulnerability and resilience)
- Applicable requirements under the PRs from the EBRD policy

In each phase of the project i.e. pre-construction, construction and operational phase, environmental and social assessment will be performed in the ESIA study, focusing on specific media and areas such as ambient air quality, climate changes, hydrology, geology, geomorphology, hydrogeology, erosion, soil, noise, vibrations, waste management, biodiversity, landscape, natural and protected areas and social environment. For this Project, decommissioning or closure is not foreseen at the moment. For this purpose, the decommissioning phase will not be part of the assessment.

9 ESIA scoping assessment

9.1 Environmental impact assessment and mitigation measures

9.1.1 Recourse efficiency (energy, water and raw material use)

Impacts in construction phase

In construction phase, the Contractor will use energy, water and raw materials in order to implement the proposed project activities.

The use of electricity is intended for illumination of construction site, works of some equipment's, in the offices and worker accommodation facilities (workers camp if any) etc. Fuel will be used for construction mechanisation, road mechanization and vehicles for transport of raw materials, waste and workers, etc.

The use of water is intended for technical, sanitary and drinking purposes in order to fully implement all proposed project activities and successfully execute the prescribed mitigation measures in the ESIA study.

For project implementation, the Contractor will use different type of natural materials such as gravel, sand, soil etc. as well as concrete, asphalts etc. If information on borrow pits and spoil disposal sites is available at this stage, the project team within the ESIA study will provide environmental screening on the appropriateness of the selected locations. All borrow pits and spoil disposal sites should be authorized.

No proper and efficient use of energy and materials may cause negative impacts on the environment.

In this phase of the project are not defined source of supplying and quantity and consumption of energy, water, natural materials required for performance of construction activities, therefore, the significance of the impacts cannot be assessed.

Mitigation measures in construction phase

In order to provide efficient use of raw materials and resources, the implementation of the following measures is recommended:

- identification of opportunities and alternatives for resource efficiency, relating to the project in accordance with GIIP,
- planning of the routes for transport activities in order to be avoided idling movements of vehicles,
- use of energy efficient equipment during construction,
- use pre-mixed concrete, asphalt and natural construction materials from existing plants, borrow pits and quarries which own environmental permits, under National (and local) regulation,
- selection of usable fraction of waste and reuse as construction material (especially surplus excavated material),
- efficient water use,
- reuse of treated waste water,
- Material efficiency & low-carbon materials:
 - Optimise road alignment and earthworks to minimise cut-and-fill volumes
 - Maximise reuse of excavated materials on site
 - Use recycled aggregates where technically feasible
 - Use warm-mix asphalt instead of hot-mix asphalt
- etc.

Impacts in operational phase

During the operational phase electricity will be required for lightening of the motorway on interchange, tunnels, toll station and the station for charging of electrical vehicles. Fuel will be used for mechanisation, on road mechanization and vehicles for transport of raw materials, waste, workers etc. which will be engaged for maintenance of the motorway.

Water in the operational phase is necessary for drinking and sanitary purposes in the toll stations (if any), as well as for firefighting.

In operational phase, the Operator of the motorway will need materials for regular maintenance of the alignment as gravel, sand, soil etc.as well as concrete, asphalts etc.

In this phase of the project are not defined source of supplying and quantity and consumption of energy, water, natural materials required for performance of construction activities, therefore, the significance of the impacts cannot be assessed.

Mitigation measures in operational phase

In order to use raw materials and resources efficiently, the following clusters of measures will be set up.

Energy efficiency:

- Use of fuel-efficient machinery,
- Regular preventive maintenance of construction machinery to reduce fuel consumption,
- Use of LED lighting for construction sites and energy-efficient lighting for permanent road infrastructure,
- Anti-idling protocols for all trucks, machinery, and site vehicles,
- Adoption of smart traffic management systems.

Efficient Use of Construction Materials:

- Optimisation of earthworks design to balance cut and fill volumes, minimizing external borrow pits and waste spoil.
- Use of recycled aggregates and reclaimed asphalt pavement.
- Use of prefabricated structures to reduce waste and material losses.

Water Use Management and Efficiency

- Use of non-potable water for dust suppression where feasible.
- Efficient water use.
- Avoiding water wastage.

Fuel and Transport Efficiency

- Optimisation of transportation routes.
- Local sourcing of construction materials when ever possible.
- Staging of temporary construction camps and asphalt/batching plants close to the alignment to minimize transport.

Waste Minimization and Material Recovery

- Segregation of construction waste to increase recycling rates.
- Reuse of excavated materials as embankment fill or landscaping material where geotechnical parameters allow.

9.1.2 Impacts on ambient air quality

Impacts in construction phase

Site preparation and construction works include a range of activities such as: cleaning and removing of vegetation, earthworks, construction works, asphaltting, concreting, welding, paving, handling of materials and waste, transport activities, etc. which are also sources of emissions to air that may impair the air quality. All these activities are associated with emissions of fugitive dust from material handling and movement of vehicles and exhaust gasses from vehicles and construction machines. Increased emissions of volatile organic compounds (in the application of asphalt and bitumen, i.e. in the asphaltting phase) may be expected as well. The outcome of the assessment of potential effects from fugitive dust and exhaust emissions is a prediction of the risk of impacts during the construction phase. The impact (negligible, low, medium or high) will depend on the scale and intensity of the construction activities (sources) and the local meteorological conditions.

The approach to this air quality assessment includes the following key elements:

- Assessment of the existing local air quality through a review of available monitoring data;
- Assessment of weather conditions through a review of historical weather data;
- Quantifying the potential impact on the air quality during construction phase;
- Identification of potential receptors.

The alignment of the proposed project deviates from the existing road and avoids inhabited places. Therefore, no significant emissions from demolition will occur in the construction phase. However, construction works such as site clearance, excavation, earthmoving, grading etc. may lead to temporary breaching the EQS. This is expected to be short term pollution and no action from the local authorities will be required.

In general, the impacts on ambient air quality in construction phase are assessed as negative, direct and cumulative, immediate, from location to local, likely to occur, short – term, reversible, with minor to moderate magnitude, minor sensitivity and moderate significance.

Mitigation measures in construction phase

In order to reduce the negative impacts on ambient air quality along the corridor of the motorway in the construction phase, the following measures are suggested:

- Dust suppression (water spraying) on access roads and surfaces that may give rise to dust emissions,
- Avoid idling of engines whenever possible,
- Avoid concentration of construction equipment at small areas and install temporary fences on the construction site,
- Erosion control measures,
- Appropriate and ontime waste handling,
- Management, control and monitoring over the implementation of the construction activities,
- Preparation of Dust Management Plan.

Impacts in operational phase

The project impact on the air quality will mainly depend on the national transport development plans, the rate of improvement of quality of the traffic fleet etc. In any case, the impact of emissions of NO₂, CO, VOC, PM_{2,5} and PM₁₀ are to be evaluated as a priority.

The operation of the proposed project will certainly have an effect of decreasing the number of vehicles using the existing road. On the other hand, it will result in air emissions of its own. Therefore, as the worst scenario, only the impact of the motorway traffic will be assessed. The assessment of potential air quality effects due to the operation of the proposed project predicts the significance of the impact at existing receptors as a result of the proposed project. The significance of impacts depends on the number and type of vehicles running on the motorway.

The approach to this air quality assessment includes the following key elements:

- Assessment of the existing local air quality through a review of available monitoring data,
- Assessment of weather conditions through a review of historical weather data,
- Ambient air impact modelling to predict the dispersion of PM₁₀, PM_{2,5} and NO_x pollutants generated by the traffic,
- Quantitative assessment of the impact of motorway on the local air quality during the operational phase.

The total emissions in the ambient air in the operational phase are expected to be higher than they are now due to expected increase of traffic density. However, they will certainly be lower than in the case of the same increase of traffic density without the project being implemented (for example due to the frequent traffic congestion).

As a result of the described activities in operational phase the impacts on ambient air quality are assessed as negative, direct, immediate, at the location, long-term, certain, reversible, with minor magnitude, minor sensitivity and moderate significance.

Mitigation measures in operational phase

In order to avoid or minimize the negative impacts in ambient air in operational phase, PESR should apply the following mitigation measures:

- Application of good practice for maintenance of the alignment especially on the embankments and slopes,
- Proper management with the generated waste through signing contracts with authorized companies for collection and transport of the waste etc.
- Vegetation buffers (green belts) along the right-of-way,
- Promotion of low-emission mobility.

9.1.3 Project impacts on climate change

The transportation sector is one of the major contributors of GHG emissions worldwide. Almost 15 percent of the global GHG and over 20 percent of energy-related CO₂ emissions are produced by the transportation sector. The larger portion of these emissions is produced during the road operation phase due to vehicle exhaust (ADB, 2010a). However, sources of GHG emissions in the road sector also include construction materials, machinery use, removal of vegetation, as well as transportation of labor, equipment, and materials, as shown in the following table.

Sources of GHG (Carbon Dioxide)	Road Project Stage		
	Construction	Maintenance	Operation
Materials	Embodied Carbon		NA
Machinery Use	Direct GHG Emissions		NA
Transportation	Direct GHG Emissions		NA
Vegetation Removal	Sequestration Potential Lost		
Road Use	NA		Direct GHG Emissions

Table 37 Sources of GHG Emissions During the Life Cycle of a Road Project

Impacts in construction phase

Sources of carbon emission during road construction and maintenance include construction materials, fuel consumed by construction machinery as well as by material and labour transport, and removal of vegetation. However, although the scope includes various activities such as site clearing, sub-grade preparation, production and transport of construction materials, and construction machinery use, the road construction/maintenance accounts for only a small proportion of the total GHG emissions produced throughout a road project's life cycle. The researches have found that construction itself contributes to less than 2 to 5 percent of the total life-cycle emission of a road project.

Other key issues also relevant as contributing factors to GHG emissions during road construction/maintenance are: the use of older machinery, under-designed drainage systems resulting in high maintenance requirements, pavement life-shortening due to overloading, deficiency of suitable materials, inappropriate compacting equipment and procedures, cement produced in older plants translating into higher emissions per ton of cement produced, and excessive use of road furniture such as steel and concrete roadside barriers which have been found to contribute to as much as 5 percent of the total GHG emissions produced during the construction of expressway facilities.

The selection of pavement type has been proven to also be an important consideration. Concrete pavement has been found to produce significantly higher amounts of GHG emissions as compared to asphalt pavement.

The impacts on climate change in this phase are assessed as negative, direct and cumulative, delayed, regional, likely to occur, short-term, reversible and irreversible, with minor magnitude, minor sensitivity and moderate significance.

Mitigation measures in construction phase

In order to minimize the greenhouse gases in construction phase, the following mitigation measures are prescribed:

- Preparation and implementation of Plan for management and removal of vegetation,
- Ignition of the existing vegetation in the project area is not allowed,
- Maximise reuse of excavated materials on site
- Use recycled aggregates where technically feasible
- Use fuel with low carbon emission,
- Use recycled asphalt and/or use recycled asphalt,
- Replace hot-mix asphalt with warm-mix asphalt,
- Replace conventional lamps with LED lamps,
- Use solar energy for lighting,
- Preparation and full implementation of the Traffic Management Plan, Plan for management with raw materials and waste etc.

Impacts in operational phase

Road operation is the single, largest contributing stage to GHG emissions during the entire life-cycle of a road project. This may be attributed to the fact that roads are usually operated for decades, but also, at these days very relevant is the fact that the large majority of the current vehicle fleet in the country is powered by petroleum-derived products such as gasoline and diesel.

Negative impacts and emission of greenhouse gases will be generated as a result of the increased traffic transport along the motorway i.e. uses of vehicles with high carbon emissions and from generation of biodegradable waste as a result of maintenance the motorway (inadequate management of this type of waste). Emergence of fires (forest fires due to burning of vegetation in the protection zone of the motorway or as a consequence of a major accident-overturning of tanks with flammable liquids or explosion of materials subject to transport), as well as other incidents in the operational phase of the motorway. All these sources of greenhouse gases will be on regional level, but will contribute to the National inventory on climate change.

The impacts on climate change in this phase are assessed as negative, immediate, direct, area, likely to occur, temporary, with minor magnitude, negligible sensitivity and negligible significance.

Mitigation measures in operational phase

In order to avoid or minimize the greenhouse gases in operational phase, PESR should apply the following mitigation measures:

- Raising awareness for use of vehicles with low carbon emissions,
- Promotion of low-emission mobility,
- Raising awareness for prohibiting the burning of existing vegetation along the route,
- Full implementation of the measures prescribed in the Waste Management Plan etc.

9.1.4 Impacts on project as a result of climate change

Impacts in operational phase

Climate change is likely to affect the motorway and its structures through higher temperatures, more severe storms and flooding and higher storm surges, affecting the reliability and capacity of transportation systems. Higher temperatures can cause pavement to soften and expand and also may cause possible fires around the motorway. This can create rutting and potholes, and can place stress on bridge joints. The occurrence of fires may damage the motorway structures and may disconnect the motorway temporary from the national network. Climate change is projected to concentrate rainfall into more intense storms. Heavy rains may result in flooding, which could disrupt traffic, and weaken or wash out the soil and culverts that support roads,

tunnels, and bridges. Also, short-term heavy rains may cause erosion and landslide that can jeopardize the earthworks (embankments etc.). Exposure to flooding and extreme snow events also may shorten the life expectancy of the motorway. The stress of water and snow may cause damage, requiring more frequent maintenance, repairs, and rebuilding. Drought could increase the likelihood of wildfires that reduce visibility and threaten roads and infrastructure.

As part of the previous ESIA work, a Climate change vulnerability and risk assessment was undertaken to identify and assess potential climate-related hazards and the vulnerability of the Project under current and future climate conditions. Based on the identified material risks, a Climate Resilience Assessment is considered to define appropriate design, operational, and management measures to enhance the Project's resilience and ensure safe and reliable design and operation throughout its lifetime.

The potential impacts on the motorway as a result of climate change are assessed as negative, direct, immediate or delayed, occurred on location, likely, temporary, reversible and irreversible, with minor to moderate magnitude, minor to moderate sensitivity and moderate to major significance.

Mitigation measures in operational phase

There are two main components in dealing with climate change: mitigation and adaptation. Mitigation is about dealing with the causes of climate change, by reducing greenhouse gas emissions (GHGs). Adaptation is about dealing with the inevitable consequences of climate change and attempting to lower the risks and improve resilience. Vulnerability and Risk Assessment focuses on the adaptation side and aims to integrate the consideration of climate adaptation into the project development cycle. For this reason, in the pre-construction phase/design phase the following activities need to be conducted:

- Identification of the scope, variables, risks, and climate data,
- Assessment and prioritization of the risks,
- Identification and selection of adaptation responses and strategies,
- Integrating the findings into the decision-making process,
- Preparation of Risk registers and adaptation measures.

Additionally, in the operational phase it is recommended implementation of the following mitigation measures:

- Temperature monitoring in order to monitor its possible rise from the closest national meteorological monitoring station,
- Cleaning up the waste around the motorway, which has the potential for ignition, for tunnels,
- Installation of flood defence systems,
- Forestation and maintaining of the vegetation.

9.1.5 Noise and vibrations

Impacts in construction phase

Each construction work is associated with an increased noise level. Use of construction machineries such as bulldozers, graders, dumpers etc. will contribute to increased noise level. Construction works at some locations should be carried out during daytime, but at others, activities may take place around the clock. Increased levels of vibration may cause damage to buildings located in the immediate vicinity of the motorway route.

The impacts in this phase are assessed as negative, direct and cumulative, immediate and delayed, on the location and area, certain, short term, reversible, with minor sensitivity, moderate magnitude and moderate significance.

Mitigation measures during construction phase

In order to minimize the negative impacts from increased noise level during construction phase the following measures should be implemented:

- Noise assessment,

- The Contractor should prepare and implement a Construction phase Noise Management Plan,
- Construction equipment and mechanization should be in accordance with the EU Directive 2000/14/EC on noise emission in the environment,
- The Contractor should not use equipment which generates excessive noise and
- Construction work at sensitive locations should be performed in well planned manners and considered time limitations.

Impacts in operational phase

Noise from road traffic is generated by the engines, the contact between wheels and road surface, sirens etc. In the operational phase of the motorway, vibrations are expected, as a result of the movement of passenger and transport vehicles. Road noise and vibrations can affect sensitive receptors, i.e. the area will be exposed to the traffic noise. Increased noise and vibration levels can affect the local population and also cause negative impacts on wildlife. Calculations of noise levels at certain receptors due to the traffic on the proposed motorway have been carried out within the scope of the previous ESIA and modelling done. Based on the modelling, mitigation measures in a form of noise barriers have been suggested on sensitive parts of the motorway to mitigate the noise.

The impacts in this phase are assessed as negative, direct and cumulative, immediate and delayed, regional, certain, long term, reversible, with minor to moderate magnitude, moderate sensitivity and moderate to major significance.

Mitigation measures in operational phase

Where calculated noise levels show a conflict with the appropriate noise limit values, noise barrier between the source and the receptor or applying a sound insulation of the individual receptor buildings are suggested. As part of the detailed design, the noise barriers are going to be designed in line with the recommendations of the modelling report.

9.1.6 Impacts on geology and soil

Impacts on geology and soil

The expected impact on geological structures and soils in construction phase would be mostly in form of degradation of certain geological formations and soil erosion. During the construction of the motorway, the impacts will be limited to the area of alignment (area of interest), particularly on the locations where bigger construction activities will be performed such as bridge pillars foundations at Buna River. The clearance operations, the removal of topsoil and earthworks will result in soil loss through erosion. Erosion risks will remain through the operational life of the motorway if the soil is left unprotected and/or devoid of vegetation.

No significant effect on soil erosion and sediment production is expected, except on the cuts and incisions. Some erosive effect will be present on the bridge pillars foundations, which can be excavated in the periods of hydrological maximum in rivers or filled by eroded deposits. However, in general, the erosion of this area will not increase considerably, especially because of flatted corridor the number of cuts will be minimal, but the expected high-water levels of the surrounding rivers and watercourses will cause a large percentage of the motorway to be raised to a safe level. That shall be main problem to solve, regarding expected landslides at embankments. Given the proposed ways of constructing and arranging slopes, the risk of landslides is expected to be minimal.

In terms of engineering-geological phenomena and processes, as a result of the variable lithology, potential impacts to be addressed are:

- Activation of new landslides, during the construction of accessible roads;
- Slide and fall of excavated material on the embankments, especially during the construction of the access roads, and
- Formation of new rills and gullies on the slopes of the access roads.

A risk of soil contamination during construction works is related to leaks and accidental spills of hydrocarbons from construction vehicles and machinery, as well as with the use of lubricants, paints, solvents, resins, or

acids. Also, contamination of soils may occur if already contaminated soils are encountered during construction works. Soil contamination can occur in the case of non-compliance with appropriate procedures during manipulation with various materials used in construction (paint, solvents, fuel, lubricants etc.), i.e. material storage as well as waste storage, which may result in their infiltration into the ground and underground.

The impacts on geology and soil in construction phase are assessed as negative, direct and indirect, immediate and delayed, on location, likely to occur, reversible and irreversible, short-term and medium-term, with minor to moderate magnitude, minor sensitivity and moderate significance.

Mitigation measures in construction phase

To establish conditions for avoiding potential impacts of the construction works on the geological structures, soils, hydro-geological phenomena and facilities and engineering-geological phenomena and processes, in the phase of detailed planning and design, the following measures should be applied:

- Choosing an appropriate solution for the dimensioning of construction sites and the necessary access roads to sections and sites where there is a possibility for potential direct and indirect pollution of groundwater and water bodies;
- Geodetic recording and remediation of potentially sensitive engineering-geological phenomena. These are the phenomena and processes that have the potential to cause geological hazards in terms of the safety and stability of the overhead structures.

For the elimination and reduction of potential impacts of the construction activities on geology and soils, hydrogeological phenomena and facilities and engineering-geological phenomena and processes, in the construction phase, it is necessary to apply management measures, including:

- Selection of appropriate and technically sound construction machinery and vehicles;
- Adoption of good construction practices and management of construction zones;
- If necessary, install and maintain control measures for erosion and sedimentation along the access roads and construction sites, in order to prevent the transport of sediments from the construction zones along the length of the motorway;
- Restricting the removal of vegetation and its progressive removal according to the degree of progress of the construction works, in order to reduce the surface area of the exposed soil and the duration of the exposure;
- Progressive rehabilitation and stabilization of disturbed ground surfaces in order to reduce erosion;
- Covering or planting of vegetation of embedded material, in case it needs a longer period of time;
- Removal of bulk earth material, as soon as possible;
- Provide equipment / vessels for evacuation of leaks.

Impacts in operational phase

In the operational phase of the motorway, impacts on the geological structures are not expected. In this phase disruption and soil erosion may be present, as well as direct and indirect pollution of soils and aquifers through vertical infiltration of fuel, oil or chemicals. Soil erosion may occur if erosion measures for the slopes are not applied or if the structures are not properly maintained and monitored. Soil contamination can occur as a result of depositing of sediment from the air (deposited sediments may occur a distance of 10 meters from the road), due to the fast sedimentation of substances heavier than air.

The impacts in this phase are assessed as negative, direct, immediately or delayed, likely to occur, on location, temporary, minor to moderate magnitude, minor sensitivity and moderate significance.

Mitigation measures in operational phase

In order to reduce or/and avoid the possible negative impacts on soils in operational phase, the following mitigation measures are recommended:

- Maintaining the vegetation and if necessary, increasing the area with vegetation;
- Following the possible occurrence of processes of soil erosion on the slopes;
- Regular control of the condition of the motorway drainage system;

- Application of European standards for the transport of passengers and goods.

In addition, to eliminate or mitigate the land pollution operational risks, primary mitigation would need to be incorporated into the detailed project design (e.g. pollution treatment measures in the motorway drainage system where a risk of pollution has been identified).

9.1.7 Impacts on surface and groundwater bodies

Impacts in construction phase

The potential impacts from this phase would be the implementation of the project activities near surface and groundwater and also presence of workers on the construction site (generation of liquid and solid waste). As a result of the construction site activities, technical, sanitary and storm water is expected to be generated, which could lead to deterioration of the ground water quality and the quality of the surface water bodies. The motorway corridor is intersected several times by river bodies and drainage channels. Sanitary waste water (liquid waste) will be generated as a result of the presence of the construction workers and visitors. During performance of the project activities, any mishandling of materials (storing and handling of the excess materials, raw and auxiliary materials, waste and chemicals such as use of lubricants, paints, solvents, acids resins or uncured concrete) may cause accidental leakage on the surface of the soil and then to penetrate and to come in contact with the groundwater indirectly and to the surface water bodies directly thus affecting the quality of groundwater bodies and surface water bodies. Suspended solids may also originate in products such as concrete, bentonite or grout used in the construction of bridges, retaining walls, etc., which are either accidentally released or dumped during cleaning of the equipment that has held these products. Changes to the existing drainage network may also occur due to the interception and redirection of the natural watercourses in order to construct drainage structures or the substructure of bridges.

The impacts in this phase are assessed as negative, direct, indirect and cumulative, immediate and delayed, local to area, likely to occur, short term, reversible, with minor to moderate magnitude, negligible to minor sensitivity and negligible to moderate significance.

Mitigation measures in construction phase

In order to minimize the emission in water in construction phase, the following mitigation measures are prescribed:

- implementation of the best techniques and good construction practices during construction, proper management with materials, waste and waste waters,
- full implementation of the project activities related to the drainage of the construction site,
- protection of the surface water bodies under the bridges with installation of textile which will collect the possible leakages or surplus concrete materials from the reconstruction,
- Temporary land-take (including access roads, worker camps, etc.) should be set away minimum 50 m from river bed;
- Installation of oil captures for collection of possible oil and fuel leakage from the construction mechanization.
- Preparation and implementation of Material management plan and Water management plan.

Impacts in operational phase

In the operational phase of the motorway, emissions in surface and groundwater bodies may be expected. Emissions of pollutants into surface and groundwater bodies might result from storm water washing away the motorway resulting from possible leakage of fuel and/or oil from the vehicles using the motorway. During the regular maintenance of the motorway, there may be a need to use construction and maintenance mechanization with a possible impact to surface and ground waters. Additionally, impacts from paint removal, vegetation maintenance and repair works may be expected. Possible negative impacts may be expected in case of some accidents on the motorway on locations close to surface water bodies and where the level on groundwater is high.

The impacts in this phase are assessed as negative, direct, indirect and cumulative, immediate and delayed, occurred on location, with likely probability, long-term duration, reversible and irreversible, with minor magnitude, minor sensitivity and moderate significance.

Mitigation measures in operational phase

In order to minimize and avoid negative impacts and emissions into surface and groundwater bodies in operational phase, the following mitigation measures should be applied:

- maintenance of oil captures and other drainage structures along the motorway;
- restricted access close to the surface water bodies with mechanization used for maintenance works;
- full implementation of the measures prescribed in the Waste Management Plan, Plan for management and removal of vegetation, Plan for management with hazards and accidental leakages etc.

9.1.8 Waste

Impacts in construction phase

In the construction phase, as a result of the construction activities, significant waste quantity is expected to be generated. These activities will generate different types of non-hazardous, inert and likely hazardous waste, such as:

- excavated earth material (surplus excavated materials, stripped topsoil and subsoil);
- biodegradable waste (grass, trees and shrubs from the process of clearing of the locations);
- mixed municipal waste (generated by construction activities and workers who will be involved in construction activities);
- packaging waste;
- waste oil;
- filters, adsorbents, wiping towels;
- contaminated soil from accidental leakage;
- waste from electrical and electronic equipment, etc.

Improper management of the generated waste can have an impact on air quality by being a source of fugitive dust, impact on soil or ground and surface water through leakage and contamination with inert and/or hazardous substances, impact on biodiversity through obstruction of movement, visual impact and bad hygiene.

At this stage, it is not known how all fractions of generated waste will be managed, nor the surplus excavated earth materials. The ESIA study will provide direction for proper management of the generated waste, but also necessary conditions that the disposal locations (temporary storage and permanent disposal of waste) should fulfil. Improper handling and management of generated waste can cause impacts on air, water, soil, biodiversity, landscape, population and etc.

The impacts in this phase are assessed as negative, direct, immediate, on the location to area, likely to occur, short – term, reversible, with minor to moderate magnitude, minor sensitivity and moderate significance.

Mitigation measures in construction phase

In order to minimize or avoid possible negative impacts in construction waste, the Contractor should prepare and implement Waste management Plan in which proper management of waste should be included following the recommendations of the Law on waste management and the hierarchy for waste management. Also, the following measures should be applied:

- Avoid or minimise the generation of waste materials as far as practicable,
- Opportunities to re-use material resources to be sought where practicable,

- Where prevention and re-use are not feasible, waste arisings to be managed in line with the waste hierarchy,
- Obtain chain of custody documentation to the final destination and use contractors that are licensed by the relevant competent authority when waste disposal is transferred offsite and/or managed by third parties,
- The contractor of the construction works to sign an agreement with legal or natural persons who have a Permit for collection and transportation of waste,
- Establishment or signing a Contract with landfill operators for temporary storage and disposal of excess excavated earth material, then landfills for temporary storage and disposal of other generated waste, as well as operators of landfills for permanent disposal of inert waste from the construction site,
- Identification, selection and classification of different types and estimated quantities of waste that can be generated at construction sites,
- Providing appropriate places for storage of various fractions of waste and their marking in accordance with regulations,
- Reuse of other types of waste, etc.

Impacts in operational phase

In the operational phase of the motorway, different fractions of waste will be generated as a result of motorway maintenance, passenger transport and goods. Improper waste management can cause negative impacts on media quality and environmental areas.

The impacts in this phase are assessed as negative, direct, immediate, on the location to area, likely to occur, short – term, reversible, with minor magnitude, minor sensitivity and moderate significance.

Mitigation measures in operational phase

In order to avoid or minimize waste quantities in operational phase, the Operator of the motorway should apply the following mitigation measures: prepare and implement Plan for waste management, implementation of procedures for waste management according to the Plan, sign contract with authorized companies for collection and transport of the generated waste etc.

9.1.9 Safe use and management of hazardous substances and materials

Impacts in construction phase

The risk of accidents or incidents may arise as a result of: technical malfunction of work equipment (construction equipment), improper handling of raw materials and auxiliaries, waste etc. The most important safety aspects during the construction phase are correlated with the formation and arrangement of the construction site, the handling and storage of raw materials, auxiliary materials, waste, the way equipment is used, mechanization, transport, etc. and they depend on the application and observance of legal obligations, good construction practices and the envisaged technical safety measures for this type of activity. During the construction phase, the following chemicals and hazardous substances is expected to be used: fuels, lubricants, oils, etc. Also, as a result of construction activities, different types of waste will be generated (non-hazardous, inert and hazardous waste) such as: excess excavated soil, contaminated soil (contaminated soil from unwanted leaks or contaminated soil that can be encountered during excavation), waste from removed vegetation, packaging waste, inert waste, etc. Improper storage and handling of waste, especially hazardous waste, can cause leakage and pollution of environmental media.

Incidental leaks of hazardous substances may occur as a result of:

- improperly arranged places for storage of hazardous substances;
- absence of tankers or other protective containers for collecting potentially expired hazardous material;
- loosening / damaging the tanks for storage of hazardous substances;
- collision of vehicles;

- spillage during maintenance of machinery or refuelling;
- Inadequate waste management, etc.

The impacts in this phase are assessed as negative, direct, indirect and cumulative, immediate or delayed, on the location, with likely probability to occur, short – term, reversible and irreversible, with minor to moderate magnitude, minor to moderate sensitivity and moderate to major significance.

Mitigation measures in construction phase

In order to minimize and avoid negative impacts in construction phase the following mitigation measures should be applied:

- Properly arranged storage of chemicals / hazardous substances and waste,
- Construction of a secondary grip system around storage containers,
- Preparation of a Hazardous Material Management Plan and Spill prevention control,
- Training of workers on possible hazards and hazards of chemicals / hazardous substances etc.
- Prior starting of construction activity the Contractor should prepare Hazardous Material Management Plan and Spill prevention control where will be addressed issues such as location and methods of storage, transport and disposal of hazardous substances and materials, as well procedure for its management.

Impacts in operational phase

Hazardous substances and materials will be used for operation and maintenance of the motorway such as fuel, lubricants, oil, herbicides etc. Hazardous waste may be generated in cases of spill of these substances and materials on the soil, packaging of materials which have hazardous substances, etc. Despite of the maintenance and operation of the motorway, hazardous substances and materials will be transported along the alignment. Hazardous materials are often transported in dismantled or packaged and unpacked form, which poses a potential risk of release / leakage into the environment in the event of accidents and other causes (leaks from containers for hazardous materials). Improper storage and handling of waste, especially hazardous waste, hazardous substances and materials can cause leakage and pollution of environmental media.

The impacts in this phase are assessed as negative, direct and cumulative, immediate, on location, likely to occur, temporary, reversible and irreversible, with minor to moderate magnitude, minor to moderate sensitivity and with minor to moderate significance.

Mitigation measures in operational phase

In order to avoid or mitigate the negative impacts caused by the improper management with hazardous substances and materials, the following mitigation measures should be applied:

- Preparation of a Hazardous Material Management Plan and Spill prevention control and emergency preparedness plans based on the accident analysis,
- Implementation of a system for proper inspection,
- Acceptance and transport of hazardous substances to be performed based on the international standards for safety transport.

9.1.10 Impacts on landscape

A typical methodology was used to assess the visual effects on the landscape from the Project which is presented below. Landscape effects could be typically assessed using a combination of factors:

- 1) The sensitivity of the landscape and receptors (as identified in the Table below). The degree to which change from a particular development can be accommodated takes into account aspects such as land use (the function of the landscape), the pattern / diversity and scale of the landscape, its openness, the scenic value of the landscape resource including designated areas for such value.

Sensitivity	Typical criteria	Typical scale	Typical examples
High	Landscapes that are: Assessed as outstanding Highly valued / important scenic areas Particularly rare or distinctive Susceptible to small changes Residential properties, settlement areas, roads within sensitive landscapes	International National	Core areas of: World Heritage Site National Park National Scenic Area Nature park
Medium	Landscapes that are: Valued more locally Tolerant of moderate levels of change Recreation or tourist areas	Regional Local	Area of great landscape value (protected landscape) Undesignated area but valued (demonstrable or specific land use)
Low	Landscapes that are: More common place Potentially tolerant of noticeable change Undergoing substantial development Industrial zones, places of work, etc.	Local	Undesignated area

Table 38 Criteria for assessment of landscape and receptor sensitivity

2) The scale or magnitude of effects (as identified in the Table below), considering the degree of change to the landscape resource.

Level	Typical criteria
High	A noticeable change to the landscape over a wide area or an intensive change over a limited area
Medium	Minor changes to the landscape over wide area or noticeable change over a limited area
Low	Very minor changes to the landscape over a wide area or minor changes over a limited area
Negligible	Not relevant to this project with reference to landscape effects

Table 39 Criteria for assessment of magnitude of visual effects

3) The significance of effects is typically assessed as a combination of sensitivity and magnitude as presented in the following Tables.

The significance of the effects on the landscape is assessed using the following thresholds (Table below), based on a combination of the sensitivity of the landscape / receptor and the magnitude of the change.

Significance	Typical criteria	Description
Major	A fundamental change to the environment	Noticeable change to a highly sensitive or nationally valued landscape, or intensive change

Significance	Typical criteria	Description
		to less sensitive or regionally valued landscape
Moderate	A material but non-fundamental change to the environment	Noticeable change to a landscape tolerant of moderate levels of change, or minor change to a highly sensitive or nationally valued landscape
Minor	A detectable but non-material change to the environment	Minor changes to a landscape considered tolerant of change
Negligible	No detectable change to the environment	No discernible change to the landscape

Table 40 Criteria for assessment of significance of the visual effects

Construction Impacts

The construction activities that would give rise to landscape and visual impacts besides those experienced during operation would include the following activities:

- Creation of borrow pits.
- Work camps - temporary settlements that can affect landscape long after ending of construction works (in some cases).
- Presence of construction compounds, storage and stockpile areas and activities within them.
- Movement of construction machinery, plant and delivery vehicles on the existing road network and temporary haul roads from the borrow pit areas.
- Presence of any large earth moving equipment.

The area within the construction zones, established at the proposed project corridor, will be temporarily changed during the construction phase. These zones, together with the localities where the construction materials will be stored, will be visually discernible, and will draw changes in the aesthetics of the area. The impact on the Buna riparian floodplain and forests in the area of Berdice will be higher in due to ongoing construction activities on the Buna river bank, where the large bridge will have to be constructed. The impact of the railway construction on the agricultural landscape elements will be considerable for the resident population. However, these changes will be of a short-term nature (during construction).

Having in mind the predominantly agricultural land along the project alignment, effects on the protected and conservationally important sites within the area of interest will be of minor importance. However, measures imposed by the contemporary good construction practice have to be an imperative. After the completion of construction activities, the disrupted and fragmented riparian forests and floodplains along river Buna ought to be subject to restoration and landscaping activities.

Operational Impacts

Considering that the motorway is largely an extension to an existing regional road rather than a newly introduced structure in the landscape, no significant changes in the physical appearance of the area under consideration and its functional properties is expected.

Concerning the impacts on visual values of the motorway operation on the Flatland agricultural riverine landscape the affected portion of the landscape is largely agricultural land that could be classified to be of low sensitivity as it is tolerant to change (already significantly altered) and is not valued as scenically important. The same is valid for structural and functional values of this landscape. The visual aspects associated with developments of this kind do not represent crucial aspect for their acceptance by the local population and it is likely that the majority of the community will regard the visual impact as being acceptable (even preferable).

Mitigation

Specific measures to reduce effects on the structural and functional specifics of the affected portion of the Flatland agricultural riverine landscape during operation of the motorway are not proposed since no major impact is expected. This is because the landscape portion within the area of interest is predominantly agricultural and natural habitats within are largely altered and/or characterised with patchy distribution.

For mitigation of the visual impacts, the following measures are proposed:

- Upon the completion of the construction works, and in accordance with the obligations incorporated in the Albanian legislation, affected areas of riverine and wetland habitats should be subject of restoration.
- Measures to avoid destruction of habitats and species representative for protected areas and areas proposed for protection have to be strict and implemented holistically. They have to be elaborated and implemented in accordance with this study (chapters on impacts and mitigation measures on biodiversity). The measures imposed by the contemporary good construction practice have to be an imperative.
- The need for clearing vegetation, trees, and forest covers will be reduced to a minimum, necessary for construction and undisturbed operation and maintenance of the motorway.
- If feasible, the vertical road gradient should be attached more to the relief of the terrain to reduce the impacts on the scenery due to land cuts, embankments and bridges.

As for the construction sites, especially in sensitive areas, habitat degradation should be limited to the minimum extent possible.

9.1.11 Impacts on biodiversity (flora, fauna, habitats) and protected areas

The biodiversity impact assessment is based on quantification (where applicable) of the envisaged changes (e.g. clearance of vegetation and habitats for the construction and operation of the Project) or qualitative criteria (e.g. analysis of the threat status of species and habitats) as well as by expert judgement.

The effects are considered in relation to the bases of several criteria: type of impact (direct or indirect), reversibility, scope of impact (spatial extent), duration, probability of occurrence and intensity. The assessment is carried out based on the phase in which the impact is predicted to occur: construction and operation.

For each potential impact of the Project, an assessment of impact significance is provided based on:

The assessment of the sensitivity of the receptor (Key Biodiversity Features) – evaluated based on seven different criteria:

- 1) EU Habitats Directive and Bern Convention . The list of important habitats is given in Annex I of the EU Habitats Directive – Natural habitat types of community interest whose conservation requires the designation of special areas of conservation. Resolution No. 4 for habitats of the Bern Convention was taken into consideration.
- 2) Nationally protected areas – this criterion takes into account the boundaries and management regimes of the protected areas (e.g. Skadar Lake Nature Park, Buna river – Velipoja Protected Landscape).
- 3) Internationally recognised areas (Emerald sites, Important Plant Areas, Important Bird Areas) which interact with the Project, i.e. the motorway infrastructure corridor.
- 4) Presence of species from IUCN Global and national red lists. The number of species listed on IUCN Global Red List in the habitat determines the value. The categories of the IUCN Red List used for this purpose are Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).
- 5) Presence of species important for Europe. This criterion takes into account the EU Habitats Directive. The important species in EU Habitats Directive are listed in: Annex II – Animal and plant species of community interest whose conservation requires the designation of special areas of conservation and Annex IV – Animal and plant species of community interest in need of strict protection.

- 6) Presence of threatened species (national red lists). The bases for this criterion are the already elaborated national red lists on flora and fauna (amphibians, reptiles and birds).
- 7) Presence of threatened bird species. This criterion is based on several international agreements. The following international documents and conventions were taken into account: IUCN Red list (2020-1), EU Birds Directive (Annex I – Species of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution; Annex II), Bern Convention and national red list.

These criteria were selected in order to demonstrate national and international (European and global) importance of the ecosystems / habitats and their species composition that can be met in the study area. The typical descriptors for sensitivity of a biodiversity receptor (natural habitats, flora, group of fauna, etc.) within the study area are presented in the Table below.

Receptor sensitivity / value	Description – typical descriptors (often dependent on professional judgment)
Very high	Very high importance and rarity, international scale and very limited potential for substitution
High	High importance and rarity, national scale and limited potential for substitution
Medium	High or medium importance and rarity, regional scale, limited potential for substitution
Low	Low or medium importance and rarity, local scale
Very low	Very low importance and rarity, local scale

Table 41 Sensitivity criteria of biodiversity receptors and natural heritage

The impact magnitude, ranked to a scale from none to high as presented in the Table below.

Impact magnitude	Description – typical descriptors
High	Long-term / permanent reduction in nature conservation value, including large habitat loss, permanent reduction in population and/or species richness.
Medium	Medium-term reduction in nature conservation value, including small habitat loss, temporary reduction in population and/or species-richness likely.
Low	Short-term disturbance to habitats / species. No permanent reduction in population size, habitat diversity and/or species richness.
Very low	Limited disturbance of habitats / species of a temporary nature.
None / no change	No loss or no detectable adverse impact(s) on biodiversity receptors.
Positive	Impact(s) would result in positive effect on individual biodiversity receptors or groups.

Table 42 Criteria for assessment of magnitude of impact on biodiversity receptors and natural heritage

The significance of effects is assessed as a combination of sensitivity and magnitude as presented in the following Tables.

Receptor sensitivity	Impact magnitude				
	High	Medium	Low	Very low	None
Very high	Major	Major	Moderate	Moderate	Negligible
High	Major	Moderate	Moderate	Minor	Negligible
Medium	Moderate	Moderate	Minor	Minor	Negligible
Low	Minor	Minor	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible	Negligible

Table 43 Impact significance matrix

Significance	Typical criteria	Description
Major	A fundamental change to the environment	Major effects on biodiversity receptor / natural heritage value usually of high to medium magnitude (e.g. substantial loss of value on a national or international scale).
Moderate	A material but non-fundamental change to the environment	Moderate effects on biodiversity receptor / natural heritage value usually of medium magnitude (e.g. substantial loss of value on a high local or regional scale).
Minor	A detectable but non-material change to the environment	Low effects on biodiversity receptor value / natural heritage usually of low or lesser magnitude (e.g. loss of value on a very local scale (i.e. immediate vicinity of the study area)).
Negligible / neutral	No detectable change to the environment	No impacts or neutral effects.
Positive	Improvement of the baseline	Increase in biodiversity receptor / natural heritage value.

Table 44 Matrix of significance categories for potential impacts on biodiversity receptors and natural heritage

For the purpose of the ESIA, a significant effect on the biodiversity values is any impact of moderate or major significance.

The projected alignment itself crosses mostly agricultural land of low biodiversity values (even the remains of Willow woodlands do not represent significant biodiversity sites). Also, it has much low impact on the surrounding thermophilic forests. Crossings over Drini river are located at peripheries of human settlements and they do not represent significant challenges. It is obvious that the projected alignment was carefully selected in terms of biodiversity and landscape protection. The most obvious challenge will be the design of the sections through Buna-Velipoja Protected landscape and especially the bridge over the river Buna. The location of the bridge over Buna is characterized by presence of very narrow riparian belt and small surface of seminatural/natural habitats. However, we should mention that the alignment is projected only through the outermost zone (transitional zone of lowest protection level) and only at the crossing of Buna river it interferes with the core zone (of higher biodiversity values).

Construction phase

The principle potential impacts on the biodiversity receptors during the construction phase of the Project include:

- Loss of terrestrial habitats – direct destruction and alteration of habitats – due to land take requirements (including access roads and other auxiliary elements). Due to its irreversibility this is considered as the key impact on the biodiversity. It relates to forested areas, riparian habitats, water ecosystems and wetlands, grasslands, pastures, meadows, etc.
- Loss of terrestrial flora and fauna.
- Mortality from construction vehicles
- Disturbance of species (breeding, foraging, roosting) due to construction works.
- Dust deposition during construction has the potential to lead to changes to plant communities.
- Adverse changes in aquatic habitats due to pollution / construction works (e.g. spillage, material storage, spoil and waste disposal).
- Risk of forest fires leading to depletion of biodiversity resources.

Primary mitigation measures are embedded within the Project design to date. Based on the principles of the mitigation hierarchy (by implementing the preventive approach of 'mitigation through routing') the designing process to date has achieved to avoid adverse direct impacts on the most important zones of the legally protected area Buna-Velipoja.

Biodiversity Mitigation Hierarchy according to PR6

Action	Response
1. Avoid	Seek to avoid adverse impacts on biodiversity.
2. Minimise	Where significant impacts on biodiversity cannot be avoided, identify ways in which project can be modified to minimise impacts on biodiversity.
3. Mitigate	Where significant impacts on biodiversity can neither be avoided nor minimised, identify measures to mitigate those impacts.
4. Offset	Where significant residual impacts on biodiversity remain, in spite of all reasonable attempts to avoid, minimise and mitigate those impacts, identify actions or projects to offset those impacts. Any offset projects must be structured and agreed with EBRD.

The basic principles of PR6 regarding key biodiversity features will be respected: no-net-loss will be implemented in the case of all priority biodiversity features (PBF) and net-gain for critical habitats (CH). These principles will guide the offset strategy if avoidance is not feasible. Actually, the project will identify measures to avoid, minimise or mitigate potentially adverse impacts and, where appropriate and as a last resort, propose compensatory measures, such as biodiversity offsets, to achieve no net loss or a net gain of the affected biodiversity.

To eliminate or mitigate the potential operational risks, primary mitigation would need to be incorporated into the further project design, at a minimum:

- Where necessary, design wildlife crossings structures (e.g. culverts, underpasses or green bridges) to minimise the habitat fragmentation effect enabling wild animals to cross the motorway
- Design pollution treatment elements to control surface water and soil pollution risk during operations of the motorway (e.g. stormwater drains and oil traps in the motorway drainage system).
- Further specific primary measures to be incorporated in the detailed project design in order to eliminate or minimise adverse effects to particular sensitive sites along the motorway alignment are also provided in the next Section.

A Biodiversity Management Plan (BMP) is to be prepared along with an appropriate assessment during the further detailed design and the accompanied detailed environmental and social appraisal and, subsequently, implemented during the construction of the Project. The implementation of mitigation strategy and BMP is to be monitored by biodiversity experts in cooperation with the relevant competent authorities (line ministry, state agencies (e.g. Albanian Environmental Protection Agency) and Management Authorities of concerned designated areas – RAPA & NAPA).

These potential impacts would be mitigated by undertaking of construction works in accordance with a Construction Environmental and Social Management Plan (CESMP) which will include, at a minimum:

- Measures of good construction practice (e.g. avoid important and sensitive habitats (e.g. alluvial terrains), avoid destruction of natural habitats, avoid temporal occupation and destruction of adjacent land; sound storage of hazardous substances (oil, fuel, etc.), provide fire-protection measures and equipment / vehicle, provide spill-kits in construction and transport vehicles, sound material and waste management practices, etc.).
- Replanting of erosion-prone areas to be conducted by indigenous plant species.
- Temporary land-take (including access roads, worker camps, etc.) would include adequate areas of land set away from sensitive biodiversity areas.
- Seasonal restriction of the construction works to minimise impacts on particular species.
- Actions to ensure contaminated material is identified, isolated and removed to appropriate landfill to avoid any impacts on the biodiversity.
- Design and implement adequate plan to monitor the implementation of measures for biodiversity protection.
- Construction of access roads should avoid the following: riparian habitats (Willow and poplar woodlands and belts; *Alnus glutinosa* stands, gravel banks along rivers), Spruce forests, calcareous grasslands.
- The waste material (concrete, iron, rocks etc.) and spoil accidentally deposited, should be immediately removed from riparian and aquatic habitats.
- All sites that should serve as temporary deposits for topsoil and raw materials have to be timely proposed by the Contractor(s) in advance in order to be assessed for possible adverse impacts on the environment and subsequently approved by the relevant Project party / authority. The following habitats should not serve as temporary deposits for raw material: riparian and aquatic habitats.
- Setting up of work camps and mechanization parks should be avoided in: all riparian habitats, all forest habitats, dry grasslands and calcareous grasslands.
- Use, as far as possible, existing and operational licensed borrow pits for providing material for construction of the motorway structures.
- If new borrow pits are deemed required, these have to be timely identified in advance in order to be assessed for possible impacts on the biodiversity and subsequently approved by the relevant Project party / authority and competent authority. It is not allowed to use raw materials from the following habitats: riparian habitats (alluvial deposits), limestone rocks with chasmophytic vegetation, dry grasslands and calcareous grasslands.
- Special attention would need to be paid to the following crossings of the motorway alignment and watercourses within the study area:
 - river Buna (42.015530, 19.467004)
 - river Drini (41.968534, 19.549851 & 41.815276, 19.643052) as well as its channel (41.809847, 19.638191)
 - river Gjader (41.914084, 19.590815)

Operational phase

- Fragmentation of terrestrial habitats, affecting associated plants and animal species – this is especially important for the riparian woodlands and belts.
- Forest fires. The frequency of forest fires can be increased proportionally to the traffic intensity.
- Pollution due to littering and waste disposal, accidental oil or fuel spills as well as due to use of salts or herbicides from road maintenance.

- Introduction of alien species.
- Road kills (collisions).

Principle measures of good maintenance practice to mitigate operational impacts from the project include, at a minimum:

- Once operational, establish sound waste management for the Project, including removal of food and carcasses from the motorway, in order to minimise attractiveness to animals and reduce collisions. Waste arising from the operational motorway is expected to be managed using the established procedures and facilities that are used across the road network in Albania.
- Restoration of riparian forests and afforestation with native species of plants (trees and herbs). The planting may also be designed to contribute to the mitigation of visual impacts and impacts on the landscape character.
- Monitoring of road kills and the effectiveness of the animal movement elements (culverts, underpasses, green-bridges, etc.) and undertake corrective measures, if required.

9.2 Social impact assessment and mitigation measures

In general, road planning decisions, construction and operation may have a number of potential direct and indirect social impacts and would typically include the following topics:

- Temporary or permanent severance of settlements, community facilities / services (e.g. educational institutions; healthcare or social services; cultural institutions and heritage; religious temples and cemeteries, and others);
- Temporary or permanent acquisition of private assets - residential properties / houses and associated facilities – involuntary (economic and physical) resettlement, as well as land-take (arable agricultural land)
- Livelihood aspects
- Change of the way of life in the affected communities
- Impact on community infrastructure
- Potential dislocation of monuments of historical/cultural and religious importance (including old cemeteries)
- Impact to workers (labour standards)
- Impact on vulnerable groups
- Health and safety and security of the people (including workers, suppliers, local communities)

Primary mitigation measures must be embedded within the project design.

In addition, Stakeholder Engagement Plan with public grievance mechanism to guide the stakeholder participation and engagement will be prepared and continuously updated and implemented during the project life-cycle.

9.2.1 Labour and Working Conditions

Labour and working conditions are a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment.

Impacts in construction phase. Construction activities pose potential risks to the wellbeing of construction workers, if not managed properly. There is the risk of adverse occupational health and safety (OHS) impacts related to personal accident or injury on any construction site of the Project, including exposure to physical hazards from use of heavy equipment, machinery and cranes; exposure to electrical hazards from the use of

tools and machinery; trip and fall hazards, including working on height; chemical hazards; exposure to construction noise; falling objects; working over water.

Additional impacts on Labour and Working conditions consider, but not limited to the following impacts:

- Potential ignorance on the rights and wellbeing of the Worker's engaged on construction works of this project (not only for the construction workers of the contractor, but sub-contractors as well);
- Lack of experience to work in road sector, and consequently increased risks of incidents;
- Lack of PPE use by the workers,
- Poor level of conditions of life in the Accommodation Camp for Workers, if such need occurs,
- Lack of health and pension insurance of the workers;

Mitigation measures in construction phase. Working conditions and workers accommodation facilities will be set in compliance with relevant national labour legislation and EBRD/IFC guidance¹⁰. Principle mitigation measures during the construction of the Project would include creation of a number of thematic plans as part of the Project's CESMP for overall social management. These documents would set out the mitigation requirements and would contain measures to ensure compliance of the Project construction with the relevant standards and legislation in the labour and working conditions domain.

The occupational health and safety performance during operation of the Project will comply with the requirements of national legislation and the Integrated Management System (IMS) of ARA.

Main Labour and Working Conditions mitigation measures, during construction phase, will include:

- Implementation of a Comprehensive Capacity Building and Training Program: Regular training will be provided to all direct and contracted workers, focusing on:
 - **E&S Management:** Application of the ESMP and compliance with EBRD ESP 2024 requirements
 - **OHS:** Specific hazard awareness, emergency response, and safety protocols
 - **GBVH:** Prevention of Gender-Based Violence and Harassment (GBVH), ensuring understanding of the Code of Conduct and reporting channels
 - **Monitoring Protocols:** Training for supervisors on data collection, incident reporting, and E&S performance tracking.
- Creation, implementation, and monthly update of a Workers' Grievance Mechanism
- Enforcement of a Code of Conduct for all engaged workers, with zero tolerance for GBVH and discrimination
- Execution of Supply Chain Due Diligence to identify and mitigate risks of child labour, forced labour, or serious safety issues among primary suppliers
- Creation and implementation of an Occupational Health and Safety (OHS) Management Plan
- Implementation of a Workers' Accommodation Management Plan aligned with EBRD guidance.

Impacts in operational phase. OHS risks during the road operation are similar to those in the construction phase, limited to the operational and maintenance activities of the road, which will be occasional and/or involve a limited number of workers.

Mitigation measures in operational phase. Maintain and implement Grievance Mechanism for Workers into the ESMS of ARA.

9.2.2 Health and Safety

Impacts in construction phase. Due to the relative distance of the nearest settlements to the motorway, community health and safety is expected to be set in risk, particularly for those road commuters who are using the main road leading towards Tirana to/from Shkodra. Access to construction sites, transportation of materials, workers and waste may generate a risk of traffic accidents. Construction works, heavy machinery

¹⁰ https://www.ebrd.com/downloads/about/sustainability/Workers_accomodation.pdf

and large transport vehicles and increased intensity and volume of the traffic will affect the normal road traffic regime in the Project area.

Other possible risks and negative impacts to public safety can be caused by entrance of unauthorised persons on the construction site. This situation is possible when the construction site is not protected by fence and when there are no information boards with relevant information about the construction works on site. Children, due to the vicinity of houses, can also enter the construction site.

During the construction phase, workers will be exposed to risks directly related to activities performed on construction sites. Potential impacts may include, but not limit to:

- Risks related to working near or on roads with live traffic may include collisions between vehicles operating inside the site, collisions of passing vehicles with site machinery, equipment and workers (in case the site is not adequately signed and physically protected);
- Injuries from construction machinery such as injuries due to roll-over of equipment and objects falling onto the equipment, collapse of equipment in use due to overloading, and failures due to poor slinging techniques for lifting equipment;
- Explosion risks which may occur from the use of solvents and ignition by sparks, static electricity, explosive atmospheres, and fire risks which may be caused by the use of flammable liquids, welding or abrasive cutting techniques used in places not specially prepared for such works, liquid gases used with an open flame, flammable and combustible materials;
- The proximity of the military training shooting range present insignificant risk to the construction workers.

Mitigation measures in construction phase. The initial consideration of the potential adverse impacts identifies the need for implementation of documents that will thoroughly contribute to the health and safety of the local community and workers, such as:

- Traffic Management Plan;
- Community Health and Safety Management Plan;
- Emergency Preparedness and Response Plan;
- Occupational Health and Safety Plan during Construction;
- Hazards Management Plan;
- Workforce Recruitment, Development and Training Management Plan during construction;
- Construction Site Management Plan.

Other plans and individual measures, in accordance with the needs identified, might be proposed during the ESIA study phase.

Impacts in operational phase. Adverse impacts to the Health and Safety of the local population and road users are expected to occur in small scale, mainly as a result from disrespect of vertical and horizontal signalization and speed limits. Also, the proximity of the military training shooting range presents insignificant risk to the road users due to its proper embankment that serves as protection for surrounding area.

Road safety audit shall be conducted as part of the assignment to to evaluate the safety performance of the planned highway, to identify potential safety hazards and recommend measures to eliminate or mitigate them.

Mitigation measures in operational phase. Mitigation measures in the operational phase will include:

- Regular road safety audits;
- Regular control and maintenance of traffic signalization.

The initial consideration of the potential adverse impacts identifies the need for implementation of documents that will thoroughly contribute to the health and safety of the passengers, local community and workers, such as:

- Emergency Preparedness and Response Plan;
- Occupational Health and Safety Plan during Operation;

- Community Health and Safety Plan during Operation, with campaign of traffic safety for local population and school children;
- Incident and Accident Management Plan.

9.2.3 Land Acquisition, Involuntary Resettlement and Economic Displacement

Impacts in pre-construction phase. Most part of the motorway section passes through fields and thus avoiding affecting the populated areas. Minor physical displacement for people is expected, but remarkable impact on livelihood can occur.

Impacts in pre-construction phase. Most part of the motorway section passes through fields and thus avoiding affecting the populated areas. Minor physical displacement of people is expected, but remarkable impact on livelihood can occur. The 2024 ESIA registered that the project footprint will affect 2,188,404 m² land of which ca. 60% is private land. In 2024 ESIA it was registered that some 23 objects will be affected with expropriation (project footprint). During this Scoping exercise it was noticed that the number of affected objects might be expected to be some higher and it could include about 27 dwelling objects (not all populated) and 28 objects used as auxiliary objects, for farming or other business purposes. In addition, it was noticed that the project footprint also narrowly passes near additional 20+ dwelling objects, not affected with expropriation line (project footprint) but can cause physical or social damage to the people living in it, hence will be considered in this assignment.

Several OHL electricity transmission lines will also have to be dislocated.

Mitigation measures in pre-construction phase. Resettlement Plan will be prepared and implemented, in accordance with EBRD requirements (ESR5) and GIIP, prior starting the construction activities (in pre-construction phase). Dislocation of OHL electricity transmission lines will be conducted in cooperation with OST, owner of the electricity transmission lines.

The following table gives overview of potential livelihood restoration measures going beyond compensation.

Table 45 Potential livelihood restoration measures beyond compensation

Measure Category	Specific Activity for Road Projects	Targeting Group
Land-Based Restoration	Land-for-Land Exchange: Providing alternative plots of equal or better productive potential (required by ESR 5 if land-based livelihoods are affected).	Farmers / Smallholders
	Soil Improvement: Distribution of fertilizers, high-yield seeds, or irrigation equipment to increase productivity on remaining land parcels.	Agricultural households
Business & Economic	Business Relocation Assistance: Assistance in identifying and securing new roadside locations with high visibility for shops or cafes.	Small Business Owners
	Branding & Marketing: Support for roadside vendors to join local tourism or "Farm-to-Table" networks (e.g., in Shkodra or Lezhë) to attract travelers.	Food/Craft Vendors
Employment & Skills	"Local First" Hiring: Contractual requirements for the road contractor to hire a specific % of unskilled/semi-skilled labor from affected villages.	Unemployed Youth / PAPs

Measure Category	Specific Activity for Road Projects	Targeting Group
	Vocational Training: Certified training in construction, hospitality, or road maintenance to enhance long-term employability.	Younger PAPs
Vulnerability Support	Micro-grant Schemes: Small, non-repayable grants for women-led households to start home-based poultry or handicraft businesses.	Women / Vulnerable PAPs
	Social Safety Net Linkage: Direct registration assistance for national social assistance programs.	Elderly / Landless

Impacts in construction phase. Adverse impact to the local infrastructure, particularly the existing road network and irrigation system is expected to occur. It is expected the local roads to experience significant increase of loaded transport vehicles, due to the project activities and therefore cause decline in the quality of service of the local roads. Some of the roads will be diverted and land-owning farmers could experience economic losses. Supplementary, it is expected some additional objects to be acquired due to their vicinity of the expropriation line and inability to avoid inflicting damage to the given objects during performing construction activities (civil works).

Mitigation measures in construction phase. Grievance Redress Mechanism should be kept active during construction and incurred losses, during construction should be carefully considered for compensation and compensated those who are justifiable, in accordance with Land Acquisition and Resettlement Framework document that will be created for this project, and which will guide the resettlement process in pre-construction phase.

Impacts in operational phase. No adverse impacts in the operational phase are foreseen, nor mitigation measures proposed.

9.2.4 Vulnerable groups

Impacts in construction phase. Vulnerable groups in the project area, have been identified and the project related construction activities could adversely affect them. Elderly farmers, female headed agricultural households, and poor farmers have been noticed in the project area of influence.

Mitigation measures in construction phase. Mitigation measures for vulnerable groups during construction shall be carefully considered during ESIA stage, particularly during the analysis of the results from planned socio-economic survey.

Impacts in operational phase. No impacts in the operational phase are foreseen, nor mitigation measures proposed.

9.2.5 Cultural Heritage

Impacts in pre-construction phase. ESR 8 on Cultural Heritage mandates the client (the entity receiving the EBRD financing) to conduct digital documentation and mapping of any potential or actual cultural heritage sites. The key potential impact during the pre-construction phase of the Project is related to the unlikely risk of omitting to properly identify and register archaeological and cultural sites of local and/or international importance.

Mitigation measures in construction phase. Hire a qualified archaeologist or cultural heritage consultant with expertise in digital documentation and mapping (e.g., using GIS and remote sensing). The specialist must execute a dedicated Cultural Heritage Assessment (CHA). This survey must scope the project's entire Area of Influence (AoI) for cultural heritage sites.

Impacts in construction phase. The key potential impact during the construction of the Project is related to the risk of partial or total removal or destruction of unknown heritage assets (undiscovered archaeological sites) due to ground removal, which implies the need for setting mitigation approach.

Mitigation measures in construction phase. During the construction works a protocol ("chance-find" procedure) is to be developed and implemented. This protocol would be in compliance with the Albanian legislation on the protection of cultural heritage and the EBRD E&S policy from 2024. Construction Site shift leaders need to be trained on the use of this procedure.

Impacts in operational phase. No impacts in the operational phase are foreseen, nor mitigation measures proposed.

9.2.6 Information Disclosure and Stakeholder Engagement

Impacts in construction phase. The public, as well as the affected parties are expected to show noteworthy interest for the project, due to its Health and Safety related impacts and access to property. This might cause some annoyance to affected parties, and cause public climate of project dissatisfaction, particularly if they have to plan their activities ahead and some roads might be temporary closed and traffic diversion is in force (alternatives must be provided, in any case), and there is no sufficient information in the media, or on visible public spaces in the settlements and municipal premises.

Mitigation measures in construction phase. During the construction works the grievance mechanism must be easily accessible online and available in printed form at the project's designated locations and municipality's premises. The investor will develop online tool for lodging grievances and reports on progress on GRM. Digital output will be gender-sensitive and accessible to people with disabilities. Similar is with the Stakeholder Engagement Plan, which must be also available to the local population at any time during the lifecycle of the project in digital and hard copy form.

Impacts in operational phase. No impacts in the operational phase are foreseen, although it is good the Stakeholder Engagement Plan to remain in function and visible in operational phase. Same is with the grievance mechanism.

10 Environmental and social cumulative impacts and mitigation measures

10.1 Introduction

Changes in the environment caused by the foreseen activities in combination with other past, present or future activities, that are similar to those foreseen in the observed area, have been assessed as cumulative impacts. In general, the cumulative effects relate to impacts that supplement the basic or interactive effects (synergy) in nature, resulting conducting of several activities at a particular time, including the impact caused by the project activity.

The cumulative effects of projects, plans, developments and existing facilities depend on the capacity of the respective environmental receptor to adapt to additional change. Actions that are minor individually may become significant when considered in combination with other major or minor actions, especially if sensitive receptors are affected.

From the submitted project documentation for construction of the motorway A4, as well as the collected data and information for the project areas and its surrounding for the predicted planning activities regarding the urban development and land use in the municipality, it can be concluded that in the vicinity of the project area, where the motorway is located, activities for implementation of the infrastructure projects are predicted. In addition, there are many smaller to medium infrastructures and facilities that are already existing and cause impacts on the environment as well as there are some facilities that have already been built and their presence

or prolonged effects from the time of their construction may contribute to the occurrence of cumulative impacts.

The construction activities for this Project are estimated to start in 2028. The project duration of the construction phase is estimated to four (4) years from the commencement day.

10.1.1 Methodology for assessment the significance of cumulative effects

The assessment of the significance of cumulative effects is based on the criteria, presented in the following table:

Significance of effects		
Significant	Severe	Effect on the receptor/resource is irreversible and the decision-maker must take into account
	Major	Effects that are likely to become issues on whether the Project design should be selected
	Moderate	Effects that are unlikely to become issues on whether the project design should be selected, but future work may need improvement on current performance
Not Significant	Minor	Effects are locally significant
	Negligible	Effects that are within the receptor's ability to absorb further impact

Table 46 Methodology for assessment of significance of the cumulative effect

10.2 Overview of the possible sources for cumulative impacts

The identified past, present and reasonably likely to occur projects in the area of the Project and its surroundings that have the potential to cause cumulative effects are:

- Rehabilitation of the Railway Line Vora - Han I Hotit
- Ionian Adriatic pipeline
- Waste water treatment plant of Shkoder (WWTP)
- High voltage electrical lines
- Pumping station at Balldren
- Gjader military airport
- Other, as identified additionally.

10.3 Assessment of cumulative impacts and effects

In order to assess the possible cumulative impacts and effects on the environmental media and social aspects that may be caused by the identified projects, in the ESIA study detailed elaboration of impacts and mitigation measures will be presented for all identified projects in combination with project for construction of motorway A4.

11 Environmental and social management plan and monitoring plan

As part of the ESIA package, Environmental and Social Management Plan (ESMP) and Monitoring Plan will be prepared.

The Environmental and Social Management Plan (ESMP) will define the impacts that may arise from the implementation of the project activity in all phases of the project, proposes measures to avoid or mitigate the negative impacts and gives clear responsibilities to the Contractor and Operator of the motorway how to manage with these questions. The plan will describe the proposed measures that need to be implemented to achieve an acceptable level of environmental and social impact, identified in the ESIA study and at the same time is a simple tool that can help meet the requirements of the legal framework and the best environmental management practices. The ESMP will establish timeframe and cost for implementation of measures as well as a system of accountability and reporting on the implementation of the proposed measures. In Annex 3 of this ESS report is presented the table according to which the ESMP will be conducted.

The ESMP shall also consider the capacities of the project owner/ EPC/contractors and will include capacity building components where necessary.

The Monitoring Plan (MP) aims to assess the degree of project implementation and the effects of implementing mitigation measures in all phases. In the monitoring plan the responsibility of each included party will be defined, environmental and social aspects and measures that should be monitored, timeframe and cost for monitoring. In Annex 4 of this ESS report is presented the table according to which the MP will be conducted.

12 Proposed ESIA scope and content for the ESIA study (Summary of terms of reference for the ESIA)

Scoping is an early stage in the E(S)IA process and is designed to ensure that the environmental and social studies provide all the relevant information on:

- the impacts of the project, in particular focusing on the most important impacts;
- the alternatives to the project;
- any other matters to be included.

Based on the identification and collection of available relevant baseline data, potential gaps within the baseline information have been identified. Additional environmental, biodiversity and social surveys should be carried out as a next step to provide sufficient baseline as part of the ESIA study. The following scope of additional surveys and timeline is proposed:

Aspect	Implementation timeline
Air quality impact modelling	January 2026 – January 2027
Targeted biodiversity surveys	January 2026 – January 2027
Socio-economic survey for Resettlement Plan purposes	January 2026 – January 2027

Table 47 Proposed timeline for the additional surveys

The scope of the proposed additional surveys shall be defined in appropriate TORs.

The Resettlement Plan (RP) provides detailed information on the specific impacts of land acquisition and resettlement activities, as well as the concrete measures to mitigate these adverse effects on affected persons.

The objective of the RP is to ensure that all persons affected by land acquisition and related project activities are properly identified, consulted, and compensated in a timely and transparent manner, and that they are provided with appropriate assistance to restore or improve their livelihoods and living standards to pre-project levels or better.

The main objectives of the RP are to:

- Identify in detail the scope and magnitude of land acquisition impacts, including physical and economic displacement
- Provide a complete inventory of affected assets and persons (Census and Asset Inventory)
- Define entitlements and eligibility criteria for all categories of affected persons, in accordance with national legislation and relevant international standards.
- Present specific mitigation, compensation, and livelihood restoration measures that go beyond cash compensation (skills development, trainings, other non-cash assistance), including timelines and implementation responsibilities.
- Ensure effective consultation, participation, and information disclosure throughout RP implementation.
- Establish a grievance redress mechanism (GRM) that is accessible, transparent, and responsive to the concerns of affected persons.
- Provide a detailed budget and financing plan for all resettlement and compensation activities, and livelihood restoration measures.
- Define institutional responsibilities and coordination mechanisms for RP implementation.
- Outline a schedule for implementation aligned with the overall project construction timeline; and
- Present a monitoring and evaluation activities to track progress, assess effectiveness, and ensure compliance with agreed standards.

The RP is a site-specific, action-oriented document that translates the principles and commitments defined in the Resettlement Framework into operational measures. It provides the basis for implementing all land acquisition, compensation, and livelihood restoration activities for the specific project components.

The RP will be prepared once the detailed design and exact project footprint are finalized and official valuation data are available. It will be submitted for review and approval by the responsible authorities and the financing institution prior to the commencement of any land acquisition or displacement activities.

Implementation of project activities that result in physical and/or economic displacement shall not begin until the RP has been fully approved and disclosed, and all affected persons have received compensation and assistance in accordance with the approved plan.

Content of the ESIA study

The findings of the scoping process define the “scope” of the environmental information to be found in the ESIA study and submitted to the competent authority and the terms of reference for the environmental and social studies to be undertaken to compile that information. Following table provides a proposed content for preparation of the ESIA study.

Content of the ESIA study defined in the TOR	
Heading	Contents
	Title page, acknowledgements, authors and contributors, table of contents (including lists of figures, tables, and maps)
1. Introduction	General Background (also including information of Developer); Project Objectives and Scope; Existing Operations; Project Location and Access to Site; Background Information; Existing Documents; Information Assembled by Technical Team; Actual Status of the Project Regarding EIA Approval at authorized Ministry; Other Related Project EIA Approvals; Comparison of Key International Standards/Guidelines
2. Project Description	Description of any previous works (like geotechnical work or else). According to project documentation, technical details of the project should be described. If any other activities which may be required as a consequence of the project is required, it should be describe.
3. Description of the Environment	The description includes information regarding: land use; overview of geomorphological, geological, hydrogeological and seismological characteristics of the terrain; water sources data; climate conditions (climate risk and adaptation, GHG quantifications) and air quality; noise and vibration, soil quality, waste management, biological and ecological resources (terrestrial and aquatic environment - habitat, flora and fauna, forest; natural assets – nature protection areas), landscape features; cultural heritage, socio economic baseline (with population and settlements data), economic activities (including hunting and forestry) in the project area.
4. Assessment of Alternatives studied by the project developer	For each project (especially for new construction) it is necessary to assess more alternatives, which will be described here. Selection procedure of most suitable one needs to be described (based on which criteria, procedure, results, etc.).
5. Associated and Potential impacts	Impacts that need to be assessed are those related to: land use; groundwater and surface waters; air quality including modelling of transport related air emissions; noise and vibration, soil quality, waste management, biological and ecological resources, landscape features; cultural heritage, socio economic aspects (with population and settlements impacts assessment), economic activities (including hunting and forestry) and institutional capacity. In assessing procedure following characteristics should be considered: • Direction of the impact (positive or negative), • Nature of the impact (direct, indirect, primary, secondary, cumulative),

Content of the ESIA study defined in the TOR	
Heading	Contents
	• Duration of the impact (short, medium and long-term, permanent and temporary), • Frequency and reversibility of the impact, • Extent of the impact (geographical area, size of the affected population/habitat/species), • Magnitude and complexity of the impact, • Probability of the impact.
6. Green Economy Transition potential	Identification of the projects or project components that meet the GET principles and criteria, in line with the EBRD GET Handbook. Assessing the physical environmental benefits of the GET projects and project components through ex-ante estimation of the physical environmental impacts of projects and/or verification of estimations undertaken by EBRD. Confirmation of the proportion of GET finance and GET benefits of a project and explaining how these fits into the GET strategy, as well as examining other contributing factors and total GET benefits.
7. Mitigation measures	Depending on estimated impacts on social and environment components and their strength it is necessary to propose protection measures to mitigate those impacts to the lowest possible level. Proposed Environmental and Social protection measures should include those prescribed by law and other regulations, protection measures in accidental situations, plans and technical solutions for environmental protection, and other protective measures. Capacity-building and training to be identified and considered where necessary. Protection measures should be divided into three phases: • Protection measures during project preparation; • Protection measures during construction; • Protection measures during operation
8. Monitoring programme of impact on the environment and social components	For planned constructions, the planned monitoring will include at least, but not limited to: • Air quality; • Soil quality; • Water quality; • Biodiversity; • Ambient noise.
9. Non-technical summary	The ESIA report should contain a precise summary about the significant results and recommended actions; it should be written in non-technical terms. The target audiences of the summary will range from government decision-makers (who are not necessarily ESIA specialists) to the general public.
10. The data on technical shortcomings, absence of the appropriate expertise and skills or,	Difficulties at this point particularly include: technical shortcomings, absence of the appropriate expertise and skills or, impossibility of obtaining the appropriate data and

Content of the ESIA study defined in the TOR	
Heading	Contents
impossibility of obtaining the appropriate data	other problems that meets the developer or designer, while collecting the data or preparation the study or project.
11.ESMP	Develop an Environmental and Social Management Plan as a part of the ESIA.

The environmental and social documentation relevant to this project also includes the following documents, in order to provide compliance of the project with the relevant requirements:

- Stakeholder Engagement Plan (SEP);
- Non-Technical Summary (NTS);
- Resettlement Plan (RP);
- Environmental and Social Management Plan (ESMP);
- Biodiversity Management Plan (BMP), and
- Environmental and Social Action Plan (ESAP).

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- Feasibility Study for the Adriatic-Ionian Road Corridor (Route 1 and Route 2) Montenegro and Albania, WB14-REG-TRA-01; September 2018; Western Balkans Investment Framework, Infrastructure Project Facility, Technical Assistance 5 (IPF 5);
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- Alternative Options Description Report, Feasibility Study for the Adriatic-Ionian Road Corridor (Route 1 and Route 2) Montenegro and Albania, WB14-REG-TRA-01; September 2018; Western Balkans Investment Framework, Infrastructure Project Facility, Technical Assistance 5 (IPF 5);
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14 Annexes

Annex 1 **Applicable Albanian national Laws and Regulations**

Albanian Legislation concerning Environmental Impact Assessment (EIA)

Legislation	Overview	Relevance to the Program and/or Project at different location
Law No. 10431 (09.06.2011)	"On Environmental Protection" – This law establishes the environmental protection framework, institutional framework and competencies, environmental impact assessment principles and environmental permitting. The law is based on European Union principles and best practice toward environment management.	It is required that an Environmental Impact Assessment (EIA) is conducted and an environmental permit obtained before initiating the Project. It establishes monitoring requirements to identify project impacts during construction / operations and rehabilitation stages.
Law No. 10440 (07.07.2011)	"On environmental impact assessment" (as amended), sets the principles of an EIA, determines the project categories with environmental impacts, and establishes the responsibilities and rights of institutions and public in the EIA procedure.	The law determines the competencies of National Environmental Agency (NEA) in the procedure, review of EIA report and final approval. The EIA for the Projects must be submitted to NEA for approval.
Law No. 10448 (14/07/2011)	"On Environmental Permit" defines the terms and conditions for granting environmental permits to industrial operators and determines measures for the prevention and control of pollution emissions and the safe management of chemicals. Generally, the objective of the regulatory regime is to: prevent environmental damage; comply with health and environmental standards; and protect against any residual liability.	Environmental Declaration applies (regulated under law 10440/2011)
Decision of Ministerial Council (DCM) No.686 (29.07.2015)	"Approval of rules, responsibilities and timeframe of the environmental impact assessment procedure". The act sets specific and detailed rules for the procedure, framework of EIA report and appendices, timeframe of the procedure, application for approval, final decision and impact monitoring and reporting during the project execution.	The ESIA report has to be prepared in accordance with this DCM in order to obtain the national environmental statement from NEA.
DMC No. 247 (30.04.2014)	"Rules for public information and involvement in the environmental decision-making procedure".	Stakeholders should be engaged/consulted throughout the ESIA process; a Stakeholder Engagement Plan (SEP) must be developed and implemented

Albanian Legislation on Biodiversity Relevant to the Project

Legislation	Overview
Law No. 9587 (20.07.2006)	"On the Protection of Biodiversity" (as amended) – This law establishes requirements for the preservation and protection of biological diversity, including protected areas, sensitive habitats and species. The law requires a biological assessment as part of the environmental assessment and collection of all relevant data for the decision-making process.
Law No. 81/2017, dated 04.07.2017	"On Protected Areas" – This law governs all matters related to Protected Areas in Albania. It determines the categories of the protected areas in Albania, management rules and roles on the decision-making process. It requires compliance with the specific rules when accessing, working and performing any other related activities nearby and/or within the protected areas.
Ordinance No. 1280, dated 20.11.2013	"On the approval of the Red List of Wild Flora and Fauna" (as amended) - This ordinance lists the status of the conservation of flora and fauna species in Albania.

Key laws related to the protection of the environment and protected areas include

Law No. 5/2016 dated 4.2.2016 On the announcement of the moratorium on forests in the Republic of Albania.

Law No. 11/2015 dated 19.2.2015 On the accession of the Republic of Albania in the multilateral agreement among Eastern Europe countries for the implementation of the Convention "On Environmental Impact Assessment in a Transboundary Context".

Law No 68/2014 for some amendments to the Law 9587, dated 20.07.2006 "On the protection of the biodiversity"

Law No 7/2014 "On the announcement of the moratorium on hunting in the Republic of Albania"

Law No.10234, dated 18.2.2010 on the accession of the Republic of Albania in the Protocol "On integrated management of coastal zone in the Mediterranean", the Barcelona Convention "On the Protection of the Mediterranean Sea Against Pollution".

Law No. 9867 dated 31.01.2008 "On establishing the rules and procedures for the international trading of endangered wildlife species"

Law No. 10 006 dated 23.10.2008 "On the protection of the wildlife"

Law No. 9587 dated 20.07.2006 "On the protection of the biodiversity"

Law No 8905 dated 06.06.2002 "On the protection of marine environment from pollution and damage" • Law No. 8906 dated 06.06.2002 "On protected Areas"

Law No. 8294 dated 02.03.1998 On the ratification of Bern Convention "On the conservation of European wildlife and Natural Habitats"

DCM No. 31, dated 20.1.2016 "On the approval of the Strategic Policy Document for Biodiversity Protection".

DCM No. 102, dated 4.2 2015 "On the establishment and the organization and functioning of the National Agency of Protected Areas"

Legislation related to protection of the physical environment

Legislation	Overview
Law No. 111/2012, amended with Law No. 6/2018	"On integrated management of water resources" amended with Law No. 6/2018 "On integrated management of water resources" based on Directive 2000/60/EC Water Framework. The aim of the law focuses on: (i) environmental protection and improvement of water, surface water, either temporary or permanent, internal sea waters, territorial waters, exclusive economic zones, continental shelf, trans-boundary waters, groundwater, and their status; (ii) security, protection, development and rational utilization of water resources, protection of water resources from pollution etc. This law provides the definition of water bodies and sets some protection and usage restrictions, and requires others to be approved by several by-laws. The law defines the banks of the water resources, restriction of certain harmful construction activities on the banks ¹¹ / shores and water protection areas.
DCM No. 177 (31.3.2005)	"On the allowed norms of liquid discharges and host water environmental criteria" - provides the allowed norms for effluent discharges on the environment, for the protection water resources.
DCM No. 379 (25.5.2016)	"On the approval of the regulation ¹² on Drinking Water Quality" - Its objective is to protect human health from the adverse effects of any contamination of water intended for human consumption, by ensuring that it is wholesome and clean. Regulates several issues related to testing of drinking water and protection zones around the water well or community ground water deposit. The regulation sets three protection zones (buffer zones) from ground water well or water deposit places on the ground. The immediate zone of protection ranges from 15 to 100 m from the axe of the well or the deposit. The precise distance is set based on the evaluation of the geological formations by the hydrogeological expert. The second and third buffer zone are circling the first one. For those zones, the regulation does not set any distance criteria, but restricts the activities that can impact the water quality such as disposal or burial of waste, mining, etc.
DCM 416 dated 15/03/2015 (ANNEX C)	"On the approval of general and special conditions, accompanying documents, validity period, application forms for authorization and permit, review and decision-making procedures and authorization and permit formats for the use of water resources"
Law No. 162 (04.12.2014 enforced by the January 2018)	"On protection of ambient air quality", fully transpose Directive 2008/50/EC on ambient air quality and cleaner air for Europe, as well as Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. This Law entered into force on 1 st of January 2018 and provides the institutional framework, regulations, roles and penalties to ensure compliance. The law stipulates that natural and legal persons, public or private, native or foreign, have a duty to keep the air clean and protect it from pollution caused by the activities they conduct in the territory of the Republic of Albania.

11 Banks" are strips of land adjoining seas, lakes, reservoirs, lagoons, ponds, rivers and streams which comprise a minimum of two areas of land: i. 5 meters at a right angle upper edge of the natural banks on steep banks and 20 meters from the maximum water level over a period of 25 years on flat banks, which can be used, on the basis of special provisions, for public purposes, ii. 100 meters at a right angle from the upper edge of the natural banks on the steep banks, and 200 meters from the maximum water level over a period of 25 years on flat banks, where every activity undertaken will be determined by the water authorities.

12 Based on Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption) concerns the quality of water intended for human consumption.

Legislation	Overview
Guideline No. 6527 (24.12.2004)	Minister of Environment and Minister of Transport "Over the permissible values of the elements of air pollutants from the environment and noise emissions caused through road vehicles and methods to control them" amended by Guideline No. 12, dated 15.6.2010 "On amendments and addenda to Guidelines No. 6527, of 24.12.2004 accompanied by the Manual of Vehicles Control.
Order of Minister of Transport and Infrastructure No. 149 (07.04.2014)	"On the approval of the rules for implementing the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organizations", fully aligned with the EU Regulation No. 748/2012 of 3 rd August 2012, laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organizations.
Instruction No. 6527 (24.12.2004)	"On allowed vehicle air emission, noise generation levels, and control methods" amended - This instruction includes requirements for annual vehicle inspections and allowed air emissions. All vehicles must comply with these norms.
DCM No. 613 (07.9.2011)	"Approval of the technical rules for the assessment of the noise conformity for the equipment installed in open spaces or environment". Sets noise release norms for certain equipment generating noise, such as electricity generators, tractors, compressors, etc. The regulation lists set thresholds.
Guidance No.10 (30.5.2015)	"Relating to the type-approval of agricultural or forestry tractors, their trailers and interchangeable towed machinery, together with their systems, components and separate technical units" based on EU Directive 2003/37/EC dated 26.05.2003.
Law No. 9774, dated 12.07.2007, amended by Law No. 39/2013	"On the assessment and administration of ambient noise" – defines the requirements for environmental protection from noise, how to avoid and prevent, reduce and eliminate the harmful effects of exposure to them, including inconvenience from noise. This Law aims to protect human health and the environment from adverse effects caused by noise emissions and sets general rules, authorities, inspection etc.
DCM No. 587, dated 07.07.2010	"On monitoring and control of noise levels in urban and touristic areas" – sets the rules and regulations on the protection from noise generation and noise level administration in urban and touristic areas.
DCM No. 1063 (23.12.2015)	"On the Approval of the technical rules for the assessment of the noise conformity for the equipment installed in open spaces or environment" sets the noise release norms for certain equipment noise generation such as electricity generators, tractors, compressors etc.
Instruction No. 8 (27.11.2007)	Ministry of Environment and Ministry of Health on "Noise levels in different media", sets the numerical values of noise in specific zones and aims to ensure adequate noise exposure protection for human health.
Instruction No. 6527 (24.12.2004)	"On allowed vehicle air emission, noise generation levels, and control methods" amended - This includes requirements for annual vehicle inspections and allowed air emissions. All vehicles must comply with these norms.
DCM No. 147 (21.03.2007)	"On the quality of petrol and diesel fuels".
DCM No. 781 (14.11.2012)	"On the quality of certain liquid fuels for thermal, civil, industrial and water transport use (sea, river and lake)".

Legislation	Overview
Law No. 10463 (22.09.2011) amended	"On the integrated waste management" (as amended) - aims to protect human health and the environment, and to ensure environmental sound management of waste through integrated management.
DMC No. 99 (18.02.2005) amended	"Albanian waste catalogue" (as amended) - which makes the classification of the waste, based on industry types, and the criteria to assess the hazardousness of the waste. The regulation codifies the waste types based on the European Waste Catalogue.
DCM No. 229 (23.04.2014)	"On the approval of the rules for non-hazardous waste transfer and the data to register in the transferring document" - The newly enforced regulation requires transferring the waste at licensed companies and ensuring final disposal in approved facilities. This act requires documenting the waste transfers and providing the final disposal certificate to the NEA. The regulation requires for all waste generating companies to be registered at NEA and obtain a personal waste generation number.
DCM No. 371 (11.06.2014)	"On the approval of the rules for transferring the hazardous waste and the data to register in the transferring document" - The newly enforced regulation requires transferring the waste at the licensed company and ensuring final disposal in approved facilities. This act requires documenting the waste transfer and delivering the final disposal certificate at the NEA. The regulation requires for all waste generating companies to be registered at NEA and obtain a personal waste generation number.
Law No. 9115/2003 (24/07/2003)	"On the Treatment of polluted water" provides regulations that state the need for treatment of polluted water before it is discharged. Article 6 sets the obligations of physical and legal entities that discharge polluted waters. Physical and legal entities, the activity of which discharges polluted waters, are obligated to take measures to: a) Continuously reduce the amount of used waters they discharge in the receiving environment; b) reduce the degree of pollution in discharging waters, especially such pollution as caused by hazardous substances and waste; c) manage and treat polluted waters. To comply with these obligations, the physical and legal entities whose activities discharge polluted waters must design a program of technical, technological and organizational measures. This program is subject to control by the Environmental Inspectorate, the licensing authority and the local government structures.

Legislation for the protection of cultural heritage

Legislation	Overview
Law 27/2018 (17.05.2018)	"On Cultural Heritage and Museums" - All matters relating to cultural heritage in Albania are governed by this law". The law defines the preservation and chance finds procedures (archaeological objects or items of cultural heritage value which are discovered by chance) to be used during Project implementation.
Article 146	Requires and obliges any person who discovers or excavates objects of cultural heritage value, by chance during construction works, to suspend work immediately and inform the relevant local authorities within three days. The relevant local authorities consist of the local government office (municipality), the Police Department and the Regional Directory of Cultural Heritage (RDCH). The RDCH verifies the situation/findings and reports to the Institute of Cultural

Legislation	Overview
	Monuments (IoCM). These institutions are responsible for assessing the archaeological value of the objects found, and determining whether work may continue or whether it must remain suspended until further ground investigations have been undertaken.
Article 5, paragraph 64 and article 31	Defines the conservation of non-material cultural heritage by measures that aim of long-lasting preservation of such cultural assets.

Laws adopted after the ratification of international conventions by the Republic of Albania

Convention name	Ratified by Albania
Law no. 9490, dated 13.03.2006 "On the Ratification of the Convention for the Safeguarding of the Intangible Cultural Heritage", Paris 2003	2006
Law nr.9806, dated 17.09.2007 On the Ratification of the European Convention "On Protection of the Archaeological Heritage"	2007
Law No. 10 027, dated 11.12.2008 "On accession of the Republic of Albania to the Convention on the Protection of Underwater Cultural Heritage", Paris 2001	2008

Legislation on health and safety

Assumptions	Risks
Law No. 10237/2010 (18/02/2010)	"On Safety and Health at Work" - This law regulates the framework of health and safety in the workplace and determines the roles of each party subject to the law.
Law No. 9863/2008	The State Sanitary Inspectorate aims to protect workers from the impacts of adverse working conditions, such as exposure to toxic substances, radiation, unworkable noise, vibrations, unfavorable microclimate, and controls the level of occupational diseases and accidents as a result of adverse conditions.
Law No. 9863/2008 (28/01/2008)	"On food" specifies the rules of food safety in Albania
Law No. 10433/2011 (16/06/2011)	"On Inspection in the Republic of Albania"
DCM No. 562/2013 (3/07/2013)	Decision of the Council of Ministers concerning the approval of the regulation on minimum safety and health requirements for the workplace.
DCM No. 312/2010 (5/5/2010)	"On safety in site construction" sets the rules of safety for construction activities.
Decision No. 692/2001 (13/12/2001)	"On special measures on safety and health protection at work"

Assumptions	Risks
DCM No. 842/2014 (3/12/2014)	"For the health and safety and protection of the employee from noise risks in the working places" requires the employer to assess the noise levels at the working place and ensure the protection of its workers

Relevant National Legislation on Stakeholder Engagement and Participation

DCM No 16, dated 14.01.2012 "On the public right for having environmental information";
 DCM No. 247 dated 30.04.2014 "On establishing the policy, requirements and procedures for public information and stakeholder participation in the decision – making environmental process";
 Law No. 119/2014, dated 18.09.2014 "On the Right of Information";
 Law No. 146/2014, dated 30.10.2014 "On Public Informing and Consultation";
 DCM No. 994, dated 02.07.2008 "On public involvement in environmental decision-making"; and
 Ministerial Guideline No.1, dated 03.03.2009 "On responsibilities of the environmental bodies to ensure the participation of the public and environmental NGO to the EIA process".

Relevant National Legislation on Land Use and Territory Planning

Legislation	Overview
Law No. 107/2014	"On Territory Planning and Development" - The law aims to integrate the urban planning legislative framework into a single law, and includes the concept of the protection of natural and cultural heritage, and community's health and safety for territory planning.
DCM No. 408 (13.5.2015 amended by DCM 231/2017)	The regulation for territorial development.
Law No. 8752/2001 (26/03/2001) amended several times	"On the establishment and functioning of the structures for land administration and protection", amended by Law No. 10257/2010 regulates land uses issues, and their compatibility with Regional Planning.

International Conventions and Agreements Signed/Ratified in Albania

Convention/Agreement	Overview	Ratified
Aarhus Convention on Access to Information, Public Participation in decision-making and Access to Justice in Environmental Matters (1998)	The Convention establishes a number of rights to the public, with regard to the environment; including access to environmental information; public participation in environmental decision-making and access to justice ¹³ .	26 October 2000

¹³ <http://ec.europa.eu/environment/aarhus/index.htm>

Convention/Agreement	Overview	Ratified
UN Framework Convention on Climate Change (UNFCCC) (1992) entered into force in 1994	The United Nations Framework Convention on Climate Change (UNFCCC) has been crucial in addressing climate change and the need for a reduction of emissions of greenhouse gases. The ultimate objective of the Convention is to stabilize greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system.	01 December 1994
Paris Agreement at the COP21 in Paris on 12 December 2015, entered into force on 4 November 2016	The Paris Agreement builds on the Climate Change Convention to combat climate change ¹⁴ .	21 September 2016
Kyoto Protocol	The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change; signatories commit to setting internationally binding emission reduction targets ¹⁵ .	01 April 2005
Convention on the Protection and Use of Trans boundary Watercourses and International Lakes (1992)	Avoid or minimize adverse effects on water resources and water quality.	5 January 1994
Convention on Biological Diversity (CBD) (1992)	Avoid or minimize adverse effects on important habitats and species, internationally and naturally designated nature conservation sites; conservation, sustainable and equitable use of biodiversity.	5 April 1994
Convention on the Protection of Wild Flora and Fauna and Natural Habitats in Europe (Bern Convention) (1976)	The Convention aims to ensure the conservation of wild flora and fauna species and their habitats. Special attention is given to endangered and vulnerable species, including endangered and vulnerable migratory species ¹⁶ ; to avoid or minimize adverse effects upon important habitats and species, internationally and naturally designated nature conservation sites.	2 March 1998
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (1979)	Avoid or minimize adverse effects upon migratory species	1 September 2001
Agreement on the Conservation of African-Eurasian Migratory Water birds (1995)	African-Eurasian Migratory Water birds Agreement (AEWA) covers 254 species of birds ecologically dependent on wetlands for at least part of their annual cycle. All AEWA species cross international boundaries during	1 September 2001

¹⁴ http://unfccc.int/files/paris_agreement/application/pdf/qa_paris_agreement_entry_into_force.pdf

¹⁵ <https://unfccc.int/process-and-meetings/the-kyoto-protocol/what-is-the-kyoto-protocol>

¹⁶ <https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/104>

Convention/Agreement	Overview	Ratified
	their migrations and require good quality habitat for breeding as well as a network of suitable sites to support their annual journeys ¹⁷ . Avoid or minimize adverse effects upon migratory water bird species.	
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1975)	CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival ¹⁸ .	27 June 2003
Convention on the Protection of the World Cultural and Natural Heritage (1989)	Avoid adverse effects upon Albanian and World Cultural Heritage sites; minimize adverse effects on unknown and intangible cultural heritage sites, material assets and other infrastructure.	10 July 1989
ILO Convention 29 Forced Labour Convention (1930) and ILO 105 Abolition of Forced Labour Convention (1957))	Its object and purpose are to suppress the use of forced labour in all its forms, irrespective of the nature of the work or the sector of activity in which it may be performed.	25 June 1957 27 February 1997
ILO Convention 87 Freedom of Association and Protection of the Right to Organize (1948)	Protects the rights of workers and employers to join organizations of their own choosing without previous authorization.	3 June 1957
ILO Convention 98 Right to Organize and Collective Bargaining	The convention provides for workers to be able to join unions and engage in collective bargaining.	3 June 1957
ILO Convention 100 Equal Remuneration Convention (1951)	Each member shall, by means appropriate to the methods in operation for determining rates of remuneration, promote and, in so far as is consistent with such methods, ensure the application to all workers of the principle of equal remuneration for men and women workers for work of equal value.	03 Jun 1957

Annex 1 List of target bird species of conservation interest

Species	IUCN WRL	IUCN ERL	Red Book of Albanian	EU BD	Bern Convention	Bonn Convention	CITES
<i>Coturnix coturnix</i>	LC	NT		II/B	III	/	/
<i>Cygnus olor</i>	LC	LC		II/B	III	/	/

¹⁷ <https://www.cms.int/en/legalinstrument/aewa>

¹⁸ <https://www.cites.org/eng/disc/what.php>

<i>Anas crecca</i>	LC	LC		II/A, III/B	III	/	/
<i>Dendrocopos major</i>	LC	LC		/	II	/	/
<i>Upupa epops</i>	LC	LC	VU	/	II	/	/
<i>Alcedo atthis</i>	LC	LC		I	II	+	/
<i>Merops apiaster</i>	LC	LC	EN	/	II	/	/
<i>Cuculus canorus</i>	LC	LC		/	III	/	/
<i>Apus apus</i>	LC	NT	LRcd	/	III	/	/
<i>Athene noctua</i>	LC	LC		/	II	/	II
<i>Caprimulgus europaeus</i>	LC	LC	LRlc	I	II	+	/
<i>Columba livia</i>	LC	LC		II/A	III	/	/
<i>Streptopelia turtur</i>	VU	VU		II/B	III	/	/
<i>Fulica atra</i>	LC	NT		II/A, III/B	III	/	/
<i>Tringa nebularia</i>	LC	LC		II/B	III	/	/
<i>Tringa ochropus</i>	LC	LC		/	II	/	/
<i>Actitis hypoleucos</i>	LC	LC		/	II	/	/
<i>Charadrius dubius</i>	LC	LC		/	II	/	/
<i>Vanellus vanellus</i>	NT	VU		II/B	III	/	/
<i>Larus ridibundus</i>	LC	LC		II/B	III	/	/
<i>Chlidonias hybrida</i>	LC	LC		I	II	+	/
<i>Chlidonias leucopterus</i>	LC	LC		/	II	+	/
<i>Chlidonias niger</i>	LC	LC		I	II	+	/
<i>Circus aeruginosus</i>	LC	LC	VU	I	II	+	II
<i>Accipiter nisus</i>	LC	LC	EN	/	II	/	II
<i>Falco tinnunculus</i>	LC	LC	VU	/	II	/	II
<i>Falco subbuteo</i>	LC	LC	VU	/	II	/	II

<i>Tachybaptus ruficollis</i>	LC	LC		/	II	/	/
<i>Microcarbo pygmaeus</i>	LC	LC	CR	I	II	+	/
<i>Phalacrocorax carbo</i>	LC	LC		/	III	/	/
<i>Ardea cinerea</i>	LC	LC	VU	/	III	/	/
<i>Ardea purpurea</i>	LC	LC	EN	I	II	+	/
<i>Ardea alba</i>	LC	LC	EN	I	II	+	/
<i>Bubulcus ibis</i>	LC	LC		/	II	/	/
<i>Ardeola ralloides</i>	LC	LC	VU	I	II	+	/
<i>Nycticorax nycticorax</i>	LC	LC	VU	I	II	+	/
<i>Pelecanus crispus</i>	NT	LC	CR	I	II	+	I
<i>Lanius collurio</i>	LC	LC		I	II	+	/
<i>Lanius minor</i>	LC	LC	DD	I	II	+	/
<i>Lanius senator</i>	LC	NT		/	II	/	/
<i>Corvus monedula</i>	LC	LC		II/B	/	/	/
<i>Corvus corone</i>	LC	LC		II/B	/	/	/
<i>Corvus corax</i>	LC	LC		/	III	/	/
<i>Muscicapa striata</i>	LC	LC		/	II	/	/
<i>Erithacus rubecula</i>	LC	LC		/	II	/	/
<i>Luscinia megarhynchos</i>	LC	LC		/	II	/	/
<i>Phoenicurus ochruros</i>	LC	LC		/	II	/	/
<i>Saxicola rubetra</i>	LC	LC		/	II	/	/
<i>Sturnus vulgaris</i>	LC	LC		II/B	/	/	/
<i>Hirundo rustica</i>	LC	LC		/	II	/	/
<i>Cettia cetti</i>	LC	LC		/	II	/	/
<i>Acrocephalus schoenobaenus</i>	LC	LC	EN	/	II	/	/
<i>Phylloscopus sibilatrix</i>	LC	LC		/	II	/	/

<i>Sylvia atricapilla</i>	LC	LC		/	II	/	/
<i>Sylvia communis</i>	LC	LC		/	II	/	/
<i>Sylvia melanocephala</i>	LC	LC		/	II	/	/
<i>Galerida cristata</i>	LC	LC		/	III	/	/
<i>Lullula arborea</i>	LC	LC		I	III	+	/
<i>Passer hispaniolensis</i>	LC	LC		/	III	/	/
<i>Passer montanus</i>	LC	LC		/	III	/	/
<i>Motacilla alba</i>	LC	LC		/	II	/	/
<i>Motacilla cinerea</i>	LC	LC		/	II	/	/
<i>Prunella modularis</i>	LC	LC		/	II	/	/
<i>Fringilla coelebs</i>	LC	LC		/	III	/	/
<i>Chloris chloris</i>	LC	LC		/	II	/	/
<i>Emberiza schoeniclus</i>	LC	LC		/	II	/	/
<i>Emberiza calandra</i>	LC	LC		/	III	/	/
<i>Rallus aquaticus</i>	LC	LC		II/B	III	/	/
<i>Streptopelia decaocto</i>	LC	LC		II/B	III	/	/
<i>Circaetus gallicus</i>	LC	LC	VU	I	II	+	II
<i>Iduna pallida</i>	LC	LC		/	II	/	/
<i>Parus major</i>	LC	LC		/	II	/	/
<i>Buteo buteo</i>	LC	LC	VU	/	II	/	II
<i>Larus michahellis</i>	LC	LC		II/B	/	/	/
<i>Gallinula chloropus</i>	LC	LC		II/B	III	/	/
<i>Egretta garzetta</i>	LC	LC	VU	I	II	+	/
<i>Alauda arvensis</i>	LC	LC		II/B	III	/	/
<i>Oriolus oriolus</i>	LC	LC		/	II	/	/
<i>Lanius excubitor</i>	LC	LC	DD	/	II	/	/
<i>Pica pica</i>	LC	LC		II/B	/	/	/

<i>Carduelis carduelis</i>	LC	LC	/	II	/	/
<i>Delichon urbicum</i>	LC	LC	/	II	/	/
<i>Cecropis daurica</i>	LC	LC	/	II	/	/
<i>Riparia riparia</i>	LC	LC	/	II	/	/
<i>Passer domesticus</i>	LC	LC	/	/	/	/
<i>Motacilla flava</i>	LC	LC	/	II	/	/
<i>Phylloscopus collybita</i>	LC	LC	/	II	/	/
<i>Aegithalos caudatus</i>	LC	LC	/	III	/	/
<i>Troglodytes troglodytes</i>	LC	LC	/	II	/	/
<i>Turdus merula</i>	LC	LC	II/B	III	/	/
<i>Acrocephalus arundinaceus</i>	LC	LC	/	II	/	/
<i>Otus scops</i>	LC	LC	/	II	/	II
<i>Remiz pendulinus</i>	LC	LC	VU	/	III	/

Annex 2 Environmental and Social Management Plan

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Pre-construction phase							
Ambient air quality							
Construction phase							
Ambient air quality							
Operational phase							
Ambient air quality							
Pre-construction phase							
Project impacts climate change							
Construction phase							
Project impacts on							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
climate change							
Operational phase							
Project impacts climate change on							
Pre-construction phase							
Climate change impacts project on							
Construction phase							
Climate change impacts project on							
Operational phase							
Climate change impacts project on							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Pre-construction phase							
Surface and ground waters							
Construction phase							
Surface and ground waters							
Operational phase							
Surface and ground waters							
Pre-construction phase							
Soil							
Construction phase							
Soil							
Operational phase							
Soil							
Pre-construction phase							
Waste							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Construction phase							
Waste							
Operational phase							
Waste							
Pre-construction costs							
Noise and vibrations							
Construction costs							
Noise and vibrations							
Operational costs							
Noise and vibrations							
Pre – construction phase							
Safe use and management of hazardous substances							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Construction phase							
Safe use and management of hazardous substances							
Operational phase							
Safe use and management of hazardous substances							
Pre-construction phase							
Impacts on biodiversity							
Construction phase							
Biodiversity							
Operational phase							
Biodiversity							
Construction phase							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Landscape and visual aspects							
Operational phase							
Landscape and visual aspects							
Pre-construction phase							
Forests							
Construction phase							
Forests							
Operational phase							
Forests							
Construction phase							
Social and community							
Operational phase							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Social and community							
Construction phase							
Labour and Working Conditions							
Operational phase							
Labour and Working Conditions							
Construction phase							
Occupational health and safety							
Operational phase							
Occupational health and safety							
Pre-construction phase							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Property and livelihood							
Construction phase							
Property and livelihood							
Construction phase							
Cultural heritage							
Pre-construction phase							
Information Disclosure and Stakeholder Engagement							
Construction phase							
Information Disclosure and Stakeholder Engagement							
Pre-construction phase							

Media/ area/ environmental and social aspects	Proposed measures for impact mitigation	Purpose	Costs	Responsibility	Time for implementation	Monitoring	KPI
Resource efficiency							
Construction phase							
Resource efficiency							
Operational phase							
Resource efficiency							

Annex 3 Monitoring plan

Receptor/Para-meter to be monitored	Where?	How?	When?	Why?	Cost	Responsibility
Construction phase						
Energy use						
Water use						
Raw material use						
Ambient air						
Climate change and GHG						
Surface and groundwater						
Geology, geomorphology, hydrogeology and erosion						
Noise						

Receptor/Para-meter to be monitored	Where?	How?	When?	Why?	Cost	Responsibility
Vibrations						
Waste						
Biodiversity						
Landscape						
Forest						
Safe use and management of hazardous substances and materials						
Social aspects						
Operational phase						
Energy use						
Water use						
Raw material use						
Ambient air						
Climate change and GHG						
Surface and groundwater						
Geology, geomorphology, hydrogeology and erosion						
Noise						
Vibrations						
Waste						
Biodiversity						
Landscape						
Forest						

Receptor/Para-meter to be monitored	Where?	How?	When?	Why?	Cost	Responsibility
Safe use and management of hazardous substances and materials						
Social aspects						

Annex 4 Terms of reference for Ambient Air Impact Modelling related to Transport Emissions

The ToR is provided as a stand-alone document.

Annex 5 Terms of reference for Biodiversity Surveys

The ToR is provided as a stand-alone document.

Annex 6 Terms of reference for Resettlement Plan Assistance

The ToR is provided as a stand-alone document.