Western Balkans Investment Framework

Infrastructure Project Facility

Technical Assistance 6 (IPF6)

TA 2016032 R0 IPA

WB16-ALB-TRA-01

Detailed Design for the Rehabilitation of the Railway Line Vorë – Hani i Hotit Albania Environmental and Social Impact Assessment Report

NON-TECHNICAL SUMMARY

July 2021, Revised July 2022

IPF6 Consortium

Western Balkans Investment Framework (WBIF)

Infrastructure Project Facility Technical Assistance 6 (IPF6)

TA 2016032 R0 IPA

Name of Sub-project

Detailed Design for the Rehabilitation of the Railway Line Vorë – Hani i Hotit, Albania

WB16-ALB-TRA-01

Environmental and Social Impact Assessment Study

Environmental and Social Impact Assessment Report

NON-TECHNICAL SUMMARY

Version	Date of issue	Contributors	Checked out	Approver	Comment
Draft V.01	Dec. 2020	Ardian Shehu Ledina Gjiknuri	Hector Martinez	Aristides Karlaftis	Draft for comments
V.02	July 2021	Ardian Shehu Ledina Gjiknuri	Hector Martinez	Aristides Karlaftis	Final document
V.03	July 2022	Abkons	Redion Biba/ Eriola Kurti	Redion Biba	Draft for comments

The Infrastructure Project Facility (IPF) is a technical assistance instrument of the Western Balkans Investment Framework (WBIF) which is a joint initiative of the European Union, International Financial institutions, bilateral donors and the governments of the Western Balkans which supports socio-economic development and EU accession across the Western Balkans through the provision of finance and technical assistance for strategic infrastructure investments. This technical assistance operation is financed with EU funds

CONTENTS

List of Tables

List of Figures

SUB-PROJECT DATA SUMMARY

ACTION	Sub-project implementation
PROJECT CODE	WB16-ALB-TRA-01
BENEFICIARY	Ministry of Transport and Infrastructure, Albania Albanian Railways / Hekurudha Shqiptare
SECTOR	Transport
COUNTRY	Albania
LEAD IFI	EBRD
GAF budget	EUR 4,500,000
IPF6 Budget	EUR 4,500,000
Assigned to IPF6	6th July 2018
Non-Objection by CA	12th December 2018
Commencement date	20th December 2018
Duration (months)	24 months + 7 months (extension)
Due date for completion	July 2021
IPF6 Key Expert responsible	Aristides Karlaftis

LIST OF ABBREVIATIONS

Abbreviation	Description
AGS	Albanian Geological Survey
AKMZ	National Agency of Protected Areas (NAPA)
Al	Albania
asl	above the sea level
CBA	Cost-Benefit Analysis
CCC	Communication on Climate Change
CD	Conceptual Design
DCM/DCM	The decision of Council of Ministers
CTC	Centralized traffic control
DD	Detailed Design
DG NEAR	EC DG Neighborhood Policy and Enlargement Negotiations
EBRD	European Bank for Reconstruction and Development
EQR	Ecological Quality Ratio
EIB	European Investment Bank
ERA	European Railway Agency
ESIA	Environmental and Social Impact Assessment
EU	European Union
EUD	European Union Delegation
FD	Functional Design Stage of the Preliminary Design
FS	Feasibility study and financial affordability analysis
G/C	Gap/Conclusion
GDP	General Development Plan
Gg	10^9 g (unit for measuring the CO_2 eq)
GHG	Green House Gas (Emissions)
GIP	Good International Practice
GLDP	General Local Development Plan
HC	Health Centre
HPP	Hydropower plant
IBA	Important Birds Area
IFI	International Financial Institution
IHM	Institute of Hydrometeorology
INF TSI	Infrastructure TSI
IPA	Important Plant Area
IPCC	Intergovernmental Panel on Climate Change
IPF	Infrastructure Project Facility
IPRO	Immovable Property Registration Office
IUCN	International Union for Nature Conservation
Kos	Kosovo

Abbreviation	Description
LUCF	Land Use Change and Forestry
MKS-64	Mercalli Scale – scale used for seismic intensity
MNR	Managed Nature Reserve
Mne	Montenegro
MoEFWA	Ministry of Environment, Forestry and Water Administration – Albania (Nowadays Ministry of Tourism and Environment - MoTE)
MoTE	Ministry of Tourism and Environment
NAPA	National Agency of Protected Areas (AKMZ)
NCCC	National Communication on Climate Change
NEA	National Environmental Agency
NIPAC	National IPA Coordinator
NMVOC	Non-methane volatile organic compound
NATD	National Agency of Territory Development
NTC	National Territorial Council
PA	Protected Area
PD	Preliminary Design
PESIA	Preliminary Environmental and Social Impact Assessment
PFS	Pre-feasibility study
R/E	Roma and Egyptian Community
REA	Regional Environmental Agency
SEE	South East Europe
SEETO	South East Europe Transport Observatory
SEP	Stakeholder's Engagement Plan
SoER	State of Environment Report
TA	Technical Assistance
ToR	Terms of Reference
UIC	International Union of Railways
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
WB	World Bank
WBIF	Western Balkans Investment Framework
WFD	Water Framework Directive

GLOSSARY

Name	Meaning
Baseline	An outline of the environmental characteristics of a receiving environment that provides the starting point for an assessment.
Consultation Authorities	Public bodies/authorities, who are legally designated to be consulted on the environmental and social aspects of the proposed project.
EIA Directive[1]	Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU: "On the assessment of the effects of certain public and private projects on the environment"
Environmental topic	This term describes the different features of the environment that may be relevant in an environmental study. Alternative terms include "environmental receptor" or "environmental issue".
Espoo Convention[2]	Adopted in 1991 and entered into force in 1997, the Espoo (EIA) Convention sets out the obligations of Parties to assess the environmental impact of certain activities at an early stage of planning. It also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.
EU acquis[3]	The *acquis* is the body of common rights and obligations that is binding on all the EU member states. Candidate countries have to accept the *acquis* before they can join the EU and make EU law part of their national legislation. Adoption and implementation of the *acquis* are the basis of the accession negotiations.
European Site	Includes Special Protection Areas (SPA), Special Areas of Conservation (SAC), and candidate Special Areas of Conservation.
Habitats Directive[4]	Directive 92/43/EU of the European Parliament and of the Council of 22 May 1992: "On the Conservation of natural habitats and wild fauna and flora". The Directive aims to promote the maintenance of biodiversity, taking account of economic, social, cultural, and regional requirements. It led to the setting up of a network of Special Areas of Conservation, which together with the existing Special Protection Areas form a network of protected sites across the European Union called Natura 2000.
Indicator	Normally associated with monitoring, an indicator is used to measure the achievement of a Plan or Environmental objective
Law on EIA[5](EIA Law)	Law no 10440, of the Albanian Parliament, of July 07.2011: "On Environmental Impact Assessment". Law is in full compliance with the EU EIA Directive

[1]http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN

[2]www.unece.org/fileadmin/DAM/env/eia/documents/legaltexts/Espoo_Convention_authentic_ENG.pdf

[3]http://ec.europa.eu/enlargement/policy/glossary/terms/acquis_en.htm

[4]http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN

[5] https://turizmi.gov.al/wp-content/uploads/2018/09/ligj-10440-2011-per-vleresimin-e-ndikimit-ne-mjedis.pdf

Name	Meaning
Objective	An intended goal, specifying the desired direction and outcome
Post-adoption statement	A summary prepared by the Responsible Authority (MEI) to outline how the assessment and consultation process has been taken into account in the adopted plan.
Recharge area	A recharge area is an area where the surface waters penetrate down into the ground, feeding thus the groundwater bodies/aquifers.
Responsible Authority	Called also Project/plan developer, a public body responsible for a plan/program/project. The responsible authority for the railway is MIE.
Service road / side road / parallel road	Service road or side road or parallel road is a road located almost parallel to the railway line that serves to connect the area located on one side of the railway line to the closest level crossing or underpass or overpass. Service roads are designed to avoid unauthorized/illegal railway crossings.
TEN-T	TEN-T is a program established by the European Commission to support the construction and upgrade of transport infrastructure across the EU[6]. The ultimate objective is to close gaps, remove bottlenecks and technical barriers, and strengthen social, economic, and territorial cohesion in the EU. Besides, the TEN-T supports the application of new technologies and digital solutions to all modes of transport. The objective is improved use of infrastructure, the reduced environmental impact of transport, enhanced energy efficiency, and increased safety[7].

[6] https://ec.europa.eu/inea/en/ten-t

[7] https://ec.europa.eu/transport/themes/infrastructure/ten-t_en

1 Introduction

1.1 The proposed project and the present document

The consortium SUEZ - IPF6 (called hereinafter "the Consultant") prepared the "Detailed Design (DD) and the Environmental Impact Assessment study for the Rehabilitation of the railway line Vorë - Hani i Hotit, Albania" (called hereinafter "the Project"). This Project is part of the indicative extension of the TEN-T Core Network in the Western Balkans, which will link Albania to the regional and European railway networks through the pan European Corridor X.

The promoter is the Ministry of Infrastructure and Energy (MIE), the implementation agency is the Albanian Railways (HSH), and the lead IFI is the European Bank for Reconstruction and Development (EBRD).

According to national, EU, and EBRD requirements, the Project should be submitted to a comprehensive ESIA process. **This document** constitutes the Non-Technical Summary of the Environmental and Social Impact Assessment (ESIA) report, as part of the ESIA study package on the Project.

1.2 Project background

The railway line Vorë - Hani i Hotit, which is approximately 120 km long, was built in two stages: from Vorë to Laç in the early 1960s, while from Laç to the Al/Mne border in the years 1980.

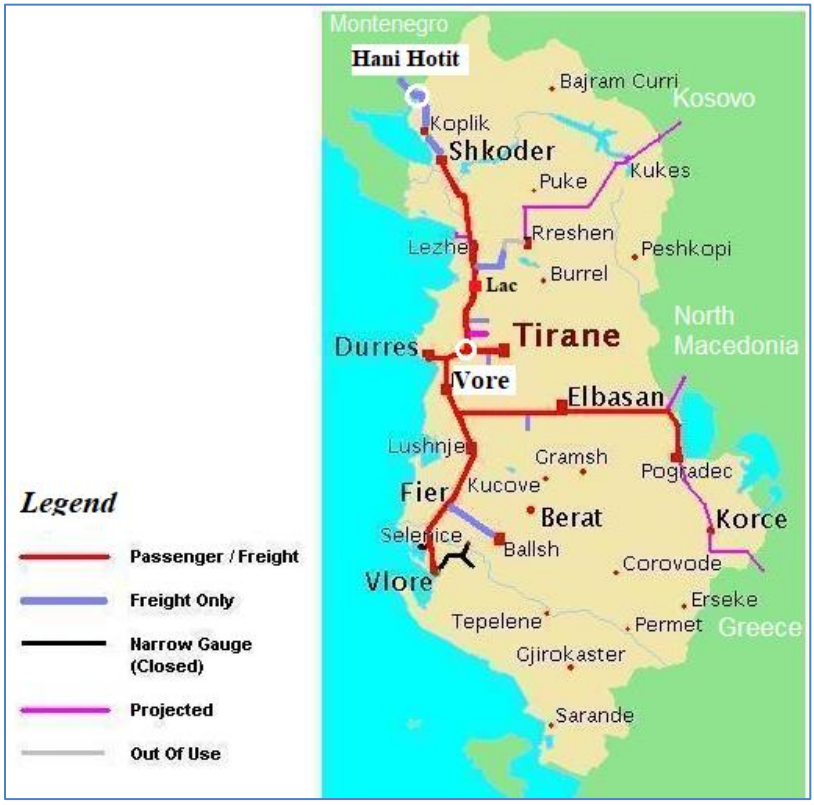

Figure 1.1_Scheme of the Albanian railway line network

The track infrastructure is in poor condition due to the lack of maintenance. The maximum operating trains speed is about 40 km/h, while in some sections, it is lower than 20 km/h. The train speed restrictions stem also from the frequent unauthorized level crossings. Most of the

formal level crossings with the national and regional roads are not protected. The signalling system, damaged during the unrest periods in 1991 and 1997, is almost inexistent. As a result, there is no controlled safety system for the trains' movement that increases the risk of accidents. The drainage system is heavily affected by erosion and sedimentation. Stations' buildings and platforms are out of standards. Bridges are deteriorated and their width does not comply with the typical 6.0 m required by the TEN-T standards. Moreover, they do not support the future electrification of the line. While the alignment geometry is rather good.

Lastly, the Earthquake of November 26.2019 has interrupted the functioning of this railway line because of the damages caused to the Ishmi River Bridge, at km 35 of the line. Before this earthquake, passenger services were carried out by only a pair of trains per day and the number of passengers was insignificant. While freight services were poor with long journey times and low demand and scheduled ad hoc.

1.3 Project's purpose and objectives

The Project aims at the following:

- Design a railway infrastructure that meets the European Railway Traffic Management System (ERTMS) requirements, including railway safety and 100 to 120km/h speed.
- create conditions for the development of passenger and freight services;
- develop a multimodal and intermodal transport in Albania and the wider region.

The fulfilling of these conditions will have the following effects:

- increase the economic growth and social development within the country;
- facilitate the trade and economic links with neighbouring and EU Member countries;

Besides, the design takes into consideration the future electrification of the railway line. That is why the cross-section width for the railway line corridor has been increased to 6.60m.

The design provides also for the future rail links to the Shengjin Port and Kosovo. The connection to Shengjin is planned at Lezhe 2 station, while Kosovo link at Mjede station.

1.4 The ESIA and the Non-Technical Summary

The Non-Technical Summary (**this document**), is part of the ESIA study package on the Project.

1.4.1 Purpose of the ESIA study

The ESIA study aims to assess the potential significant adverse impacts of a project before its approval. Besides, it takes into account the stakeholders' concerns in the environmental decision-making process during the whole project's life cycle.

The ESIA study is composed of a package of documents, including the ESIA Scoping report, which precedes the preparation of the ESIA report (the main report). The ESIA Scoping report defines the main issues to be taken into consideration in the ESIA report. Whether necessary the Scoping report influences the project design and avoids/ eliminates the project's options that may cause significant impacts to the environment. The conceptual and preliminary design of the proposed project have been already influenced during the ESIA scoping stage.

The ESIA report deals mostly with the strategies and measures to avoid/mitigate the negative impacts and, whenever possible, to enhance the positive ones. In the function of the ESIA findings, the future lender(s) will decide on the possibility of the project's financing. IFIs,

including EBRD[8] finance only the projects that are environmentally friendly and therefore comply with their environmental and social standards.

The ESIA report is also necessary to obtain the Environmental Declaration from the Ministry of Tourism and Environment that is indispensable to obtain the construction permit. As the project area covers the territory of seven municipalities, the construction permit for the proposed project needs to be approved by the National Council of Territory Planning (NCTP), which is led by the Prime Minister. The necessary documents include the Environmental Permit and the approval from the National Agency of Territorial Planning (NATP).

1.4.2 How this ESIA study has influenced the Project's design?

During the scoping stage, the ESIA study has influenced the preliminary design, including:

- *Expected impacts:* The land surface required for the service roads constitute the main permanent negative impact.

  Mitigation measures already taken into account in the preliminary Project's design: Using, as much as practicable, the existing local roads as service roads to reduce this impact. Thus, roughly 80% of the land surface required falls in existing municipal local roads and the Albanian Railways property;

- *Expected impacts:* From km 32 to 35 and km 69 to 74, the railway line crosses areas that are prone to rivers' floods. During flood events, the railway functions as an embankment that does not allow the water to spread on both sides. Thus, on one side, the inundation lasts longer and the damage to agriculture is higher than on the other side.

  Mitigation measures already taken into account in the preliminary Project's design: Three additional new culverts are designed from km 32 to km 35; Nine additional box culverts have been added from km 73 to km 79; The diameter size of the existing culverts that will be replaced by new ones was increased; The design has increased both the vertical railway line alignment and the bridges conveyance (e.g. Ishmi and Droja Bridges); The design has improved the drainage channels both sides of the railway line and their conveyance up to Ishmi Riverbed (km 35).

- *Expected impacts:* Land use restriction from the closure of the illegal railway line crossing within the agricultural areas and of the railway line fencing. As a result, the farmers cannot reach their land located on the opposite side. E.g. km 23 to km 35.

  Mitigation measures already taken into account in the Project's design: Km 32 to km 35 -three additional new culverts with sufficient diameter size (3x2m) have been added. They will serve in the same time as agricultural underpasses; a new underpass is designed at km 94+370 to allow a group of farmhouses built recently to be connected to their agricultural land and the centre of the village (Spathari Village); four additional underpasses have been designed from Lezhe to Shkoder (km 81+ 240, km 86+740, km 87+000 and km 95+679) cross the agricultural area to facilitate the traffic both sides of the railway line;

- *Expected impacts:* During heavy rainfalls, the railway line from km 69+000 to 74+000 could be damaged by the water flow coming from Lezhe's Drini and Fangu drainage channel, as it occurred in the past (e.g. winter 2002).

  Mitigation measures already taken into account in the preliminary Project's design: Increase of 0.3 to 1.0m the vertical alignment from km 70.00 to km 80; nine oversized

[8] https://www.ebrd.com/environmental-and-social-policy.html

(new box culverts damages from the overflow of Fangu Channel; Design appropriate drainage channels alongside the railway line.

- *Expected impacts:* From approximately km 107 to km 113, the railway runs over the Upper Shkoder Quaternary gravel aquifer, which supplies drinking water to roughly 150.000 inhabitants. The thickness of the clayey sandy cover is only a few meters, and there is a risk for groundwater pollution and therefore for the drinking waters.

  Mitigation measures already taken into account in the preliminary Project's design: The design has avoided the construction of any new eventual underpass within this section.

- *Expected impacts:* Difficulties to design and built underpasses within the lowland because of the shallow water table. The Municipalities of Kruje, Kurbin, Lezhe, and Shkoder have also expressed this concern.

  Mitigation measures already taken into account in the preliminary Project's design: No underpass has been designed in the sections where the high of the railway was insufficient.

The ESIA study has influenced also the conceptual design of the railway line branch connecting the planned Lezhe 2 station to the port of Shengjin. This influence consists of the avoidance of the possibility that the railway serves as a barrier in case of inundation of the Balldren field.

1.4.3 Purpose of the Non-Technical Summary – this document

The Non-technical Summary (**this document**) gives in a non-technical language the following[9]:

- The role of the EIA in the Development Consent process;
- A concise and comprehensive description of the Project, the baseline information, the likely environmental effects, and the proposed mitigation measures;
- Any significant uncertainties about the Project and its environmental effects; and
- An overview of the approach to the assessment

1.4.4 Limitations

There were several limitations to the ESIA package documents that relate mainly to the socioeconomic issues, as follows:

- contested local elections which took place in June 30, 2019 and the post-election situation[10] particularly in Vore Municipality, where Mayor and staff changes have continued as of July 2019 to January 2021, affecting the data collection process and counterparts' continuity and availability;

[9] EU "Guidance on EIA", 2017

[10] ODIHR Election Observation Mission Final Report states that *"… the 30 June local elections were held with little regard for the interests of the electorate. The opposition decided not to participate, and the government determined to hold the elections without it. In the climate of a political standoff and polarisation, voters did not have a meaningful choice between political options. In 31 of the 61 municipalities mayoral candidates ran unopposed. Political confrontation led to legal uncertainty, and many decisions of the election administration were taken with the political objective of ensuring the conduct of elections.."* available at https://www.osce.org/files/f/documents/1/f/429230_0.pdf

- the devastating earthquake of November 26, 2019 which heavily affected 4 out of 7 municipalities[11] along the alignment and unavailability of counterparts (key informants) in these municipalities (November 2020 to March 2021);
- outbreak of Covid-19 pandemic situation as of March 2020 which adversely affected contacting and meetings with key informants. Often it was challenging or even impossible to reach key informants due to Covid 19 situation;
- lack of disaggregated (at the level of villages/settlements), comparative and updated statistical socio-economic data for the project area. Census 2011 data are too old and not updated. Reports available online, provide general data at the municipalities level, which are not broken down at villages/settlements level to allow for better analysis of the affected communities. Websites of affected Municipalities were not up to date with information on socio-economic aspects, with websites of Kurbin and Vore municipalities not functional during the implementation of this study. This limitation has been overpassed by scrutinizing the documentation at the social sectors of the affected municipalities and administrative units, as well as through consulting them continuously.

1.5 Structure of this document

This document is structured as follows:

- Chapter 1: Introduction. The chapter includes the Project background and key stakeholders, its purpose and objectives along with the purposes of the ESIA report and the Non-Technical Summary;
- Chapter 2: The Project. The chapter discusses the Project area along with the Project elements, as well as a short comparison of the considered Project's options;
- Chapter 3: Regulatory framework and guidelines. Under this chapter are discussed the key requirements on the ESIA report and the Non-Technical Summary;
- Chapter 4: Impacts Assessment Methodology. The chapter provides for the approach and methodology for Project impacts' evaluation;
- Chapter 5: Baseline information and Impacts and Mitigation;
- Chapter 6: Main findings: This short chapter gives the main findings of the ESIA report regarding the environmental and socioeconomic effect of the proposed project;
- Appendix - Maps and figures: Some maps and figures are placed and the end of this document, to clarify the discussed issues.

2 The Proposed Project and the Project Area

This chapter outlines the project area and the main elements of the proposed project.

2.1 Outline of the project area and its main features

The Vore-Hani Hotit railway line runs in the Western Lowland of Albania and has a general South to North direction (see Figure 7.1). The railway connects the urban centres of Vore, Mamurras, Lac, Milot, Lezhe, Shkoder, and Koplik. It crosses the state border Al/Mne at Hani Hotit (km 140).

[11] https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/albania_post-disaster_recovery_a_v9.0.pdf

As per the Albanian administrative division[12], the railway line traverses the territories of seven municipalities (Vore, Kruje, Kurbin, Lezhe, Vau Dejes, Shkodër, and Malësia Madhe).

The planned railway track generally follows the existing one. The improved alignment affects only some short sections, which are located almost joint to the existing track and therefore they do not affect the extent of the geographical location of the project area.

The railway line runs almost in flat terrain. From Km 20 +560 to Km 133+ 000, it traverses flat agricultural areas and some urban centres (Lezhe and Shkoder). From Km 133 to km 139 it runs in flat terrain mostly through shrubs and degraded forest, while from Km 139 +000 to Km 140 + 000 (Hoti Village to Hani Hotit), it runs in a mountain foot near Shkoder Lake.

The railway line crosses seven rivers (Ishmi, Droja, Mati, Drini of Lezhe, Gjader, Drini, and Kiri) and several streams. Some agricultural plots on both sides of the existing railway line are often inundated during heavy rainfalls (e.g. left side of Ishmi River, north of Lezhe town).

Within the territories of Shkoder and Malesia Madhe Municipalities, the railway line crosses the eastern edge of the sustainable development zone of a Protected Area (Nature Managed Reserve of Shkoder Lake[13]). However, both the national regulations and the Management Plan of this Protected Area allow the Project's development.

Some railway line sections cross areas that may be affected by strong earthquakes. These sections run over unconsolidated Quaternary deposits that cover areas affected by active neotectonic faults In these sections the earthquakes may damage the railway bridges (e.g. Ishmi River Bridge damaged by the Earthquake of November 26.2019) or the rails.

The crossed area is often affected by informal constructions near the railway (e.g. Shkoder and Malesia Madhe municipalities). Numerous unauthorized local roads and pedestrian paths that constitute a risk to cars, humans, and farm animals cross the railway line.

2.2 Outline of the Project

The Project elements include the Project's components and activities.

2.2.1 Railway line components

The railway line components are as follows:

- Superstructure: rails, sleepers, fastening components, protective layer, and ballast;
- Sub-structure: sub-ballast or formation and the subgrade or natural layer, which plays a role similar to that of a building foundation;
- Structure: tunnels, bridges, underpasses, overpasses, culverts, drainage channels, and retaining walls;
- Other elements: level crossings, stations; fencing, signalling, and telecommunication.

The schematic figure below shows the components of the superstructure and sub-structure.

[12] Law no 115/2014 "On the administrative-territorial division of local government units in the Republic of Albania"

[13] DCM 684/2005.

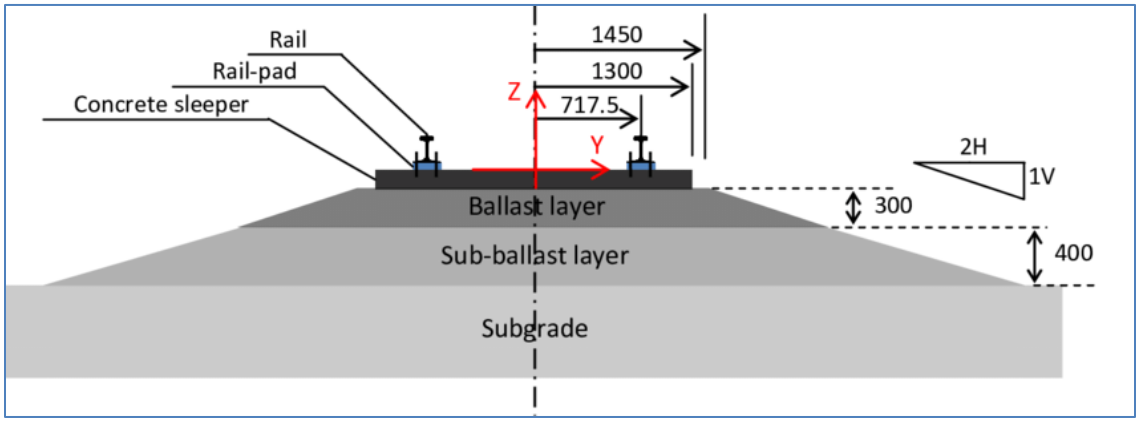

Figure 2.1_Schematic cross-section of the railway track

2.2.2 *Planned interventions*

The Project aims to improve the passenger and freight transport services and increased safety and trains' speed in accord with the EU standards. The technical objectives include:

- improvement of the horizontal alignment to allow the trains' speed of 100-120 km/h;
- improvement of the vertical alignment to avoid railway inundation (km 69 to 74);
- replacement of superstructure (ballast, sleepers, fastening, switches and tracks);
- replacement and rehabilitation of substructure components (sub-ballast, subgrade);
- rehabilitation and improvement of structure components (bridges, culverts, retaining walls, underpasses, pedestrians' overpasses, bridges and Lezhe tunnel);
- consolidation of level crossings (reduction of the number of crossings, secured level crossings, rehabilitation and/or interlocking improvements);
- the design of service roads, almost parallel to the railway line that will serve the local population and will avoid unauthorized crossings;
- the installation of appropriate signalling and telecommunication systems;
- fencing the line (where applicable);
- the rehabilitation/reconstruction of the stations

Besides, the design takes into consideration the future electrification of the railway line and therefore the cross-section width for the railway corridor has been increased to 6.60m.

The design provides also for the future rail links to the Shengjin Port and Kosovo. The connection to Shengjin is planned at Lezhe 2 station, while Kosovo link at Mjede station.

2.2.3 *Considered Project's options and selected option*

2.2.3.1 Considered options

During the Functional Design stage and the ESIA scoping report preparation, the Consultant has taken into consideration two options for the proposed project, as shown in the table below.

Table 2.1_Considered project's options

Option 1 – basic option	Option 2- expensive option

Construction of 54 secured level crossings	Construction of 32 new overpasses to avoid the level crossings with the primary and secondary roads; Construction of 22 secured level crossings
The common characteristics of both options include: • Improvement of the railway line horizontal alignment in some short sections, from 300m (existing radius) to 500m, for reaching the required EU standards; • Improvement of the railway line vertical alignment in some sections to avoid the railway line inundation during flash floods; • Construction of approximately 112 km of service roads (4m wide; non-paved), almost parallel to the railway line, to allow the circulation of the cars and therefore to avoid the informal crossings; • Closure of all unauthorized crossings and construction of 54 secured level crossings; • Demolition of almost all the existing bridges and the construction of new bridges, in the same locations. The biggest of them (Mati, Drini, and Kiri ones) will not be demolished; • Reconstruction of almost all the existing stations. The stations' buildings will be built within the Albanian Railways property; • Construction of a new freight station in the north of Lezhe town, pertly in Albanian Railways property and partly in private arable land; • Rehabilitation of protection works against rivers' erosion; • Fencing the railway line; • Construction of new signalization and telecommunication system; etc.	

2.2.4.2 Rapid assessment of the considered options

Option 2 is disregarded because of the high cost for the construction of 32 overpasses. This decision complies also with the environmental findings of the ESIA scoping report, according to which Option 2 is less environmentally friendly than Option 1 (the basic option) because, Option 2 affects significantly several environmental receptors, including the following:

- Impact on the landscape by the presence of 32 overpasses across typical agricultural and urban landscape;
- Adverse impact (access difficulties, visual barrier, etc.) to the inhabited areas near the railway line due to the raise of 32 roads on both sides of the 32 new overpasses;
- Need for a considerable amount of raw material for producing concrete and crushed stone and therefore decrease of gravel and sand within the riverbeds;
- Need for a considerable amount of raw material for increasing the vertical alignment of 32 roads on both sides of the 32 overpasses;
- Erosion of the rivers and streams beds as a result of the extraction of sand and gravel for the construction of 32 overpasses;
- Erosion of the coastal area because of the decreased amount of sediments transported to the Adriatic Sea by the rivers crossed by the railway line.

2.2.4.3 Preferred option

Based on the above, Option 2 (construction of 32 overpasses) is disregarded, and therefore the only feasible Project's option is Option 1 ("the basic option"). The Steering Committee agreed on this selection and EBRD gave the non-objection[14].

As a result, hereinafter and during the whole ESIA report preparation, the term "the Project" means "the basic option", which main characteristics are given in Table 2.1 above.

3 Regulatory Framework and Guidelines

The ESIA process fulfils the Albanian and EU regulations and EBRD standards. As provided in the Inception Report on the Project, when these regulations/standards differ from each other, the most stringent of them is applied[15].

> ***Note:*** The term "EIA" in Albanian and EU environmental regulations, include also the social issues, and therefore "EIA" according to these regulations means "ESIA" according to EBRD environmental terminology

3.1 Key Requirements on ESIA Report and the Non-Technical Summary

The ESIA report and the associated reports (ESIA Scoping report and the Non-Technical Summary) should fulfil the requirements given in the table below.

Table 3.1_Regulations and guidance on the ESIA report and its associated documents

ESIA Study package deliverables	Standards followed for the proposed Project
ESIA Scoping report	EU "Guidance on Scoping"
ESIA report content	-EU EIA Guidance on the preparation of the EIA report[16]; -CMD 912/2015 "On national EIA methodology"; -EBRD Environmental and Social Policy[17] (April 2019)
Non-Technical Summary	EU "Guidance on EIA"

3.2 Requirements on Impacts Assessment Methodology

The approach and methodology for impacts assessment are based on the EU "Guidance on EIA" and good international practice (GIP), as well as on the previous experience of the ESIA team on transport projects in Albania. It should be underlined that the Albanian DCM 912/2015 "On national EIA methodology" fully complies with the EIA Directive. Thus, the used methodology complies with both the national and EU requirements.

[14] EBRD non-objection. See SEP

[15] WB16-ALB-TRA-01. Inception Report. SUEZ-IPF6. February 2019

[16] https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf

[17] https://www.ebrd.com/news/publications/policies/environmental-and-social-policy-esp.html

4 Impacts Assessment Methodology

The approach to the ESIA includes a general approach for structuring the report and the impacts' evaluation methodology. There are strong relationships between the environmental standards, the Project's components and activities, and the general approach to be followed for such studies. Besides, the stakeholders' concerns have been taken into consideration.

4.1 General Approach

The approach used for assessing the potential impacts is summarized below, and it includes more specifically, the following steps:

- Defining the project's area;
- Outlining the project's specific technical interventions and the related environmental and social impacts;
- Consultations with the affected municipalities and other relevant stakeholders;
- Describing the baseline information;
- Defining the environmental and social impacts that will be taken into consideration;
- Evaluating the significant potential environmental and social impacts.

4.2 Evaluation of impacts significance

Impacts are evaluated in terms of "significance", which assessment "relies on informed experts' judgments about what is important, desirable or acceptable with regards to changes triggered by the Project in question. These judgments are relative and must always be understood in their context". The assessment methods should define clear thresholds or criteria for determining whether an impact is significant, based on the characteristics of an impact, in a clear manner.

4.2.1 National and EU regulations

The evaluation of impacts' significance is based on Annex III (3) of the EIA Directive[18], as well as in Annex I of CMD 686/2015 "On National EIA methodology"[19].

Once evaluated, the potential impacts should be dealt with a mitigation strategy, which will aim at minimizing and reducing the likely adverse effects and, whenever possible, enhancing the positive environmental effects of the project. The principles of mitigation, including their hierarchical setup, follow four steps:

a. Preference for avoidance and prevention;

b. Cancellation;

c. Mitigation; and

d. Remedial/Compensation

4.2.2 Guidelines and Practical considerations

[18] http://ec.europa.eu/environment/eia/eia-legalcontext.htm

[19] http://www.qbz.gov.al/botime/fletore_zyrtare/2015/PDF-2015/145-2015.pdf

The criteria for evaluating the significance include the impact's magnitude and the sensitivity of the receiving environment[20]: Magnitude defines how large an impact might be. It reflects the area of land and the amount of a particular resource or the number of affected people. Magnitude is closely linked to the stakeholders' concerns and is determined mostly by empirical prediction. While the determination of the sensitivity involves more subjective judgments in terms of how a certain environmental receptor is valued in society. Some discretion from the environmental expert is, therefore, required in assigning different weights to the criteria.

The last and final step for evaluating a potential impact on a receiving environment is the definition of the impact significance, the principle of which is described in the table below.

Table 4.1: Characterisation of potential impacts in terms of significance

Significance of impact	Description
Biophysical and socio-economic receptors	
Insignificant (Negligible)	The receptor will not be affected in any way by the proposed development activities, or the potential effect is considered to be of "negligible" intensity or is imperceptible/indistinguishable from the natural/social background variations;
Minor (Low)	The impact will occur (with and without mitigation. The impact magnitude is small (with and without mitigation) and within the accepted standards, and/or the value/sensitivity of the receptor is low.
Moderate	The impact can be reasonably reduced to a level that is as low as practicable. This does not mean that a "moderate" impact can be reduced to a "minor" one, but that moderate impacts can be effectively managed.
Major (High)	Impacts of large magnitude affect a resource/receptor of high value/sensitivity, or the accepted standards/limits are exceeded. In this case, in the function of the regulations/standards, the adverse effects must be weighed against the positive ones until a decision of the key stakeholders.

5 Relevant Baseline Information and Impacts and Mitigation

This chapter gives the baseline information, the expected significant impacts, and the suggested mitigation measures.

5.1 Air Quality

Baseline information: According to official annual data[21], the air quality near the railway line is within the accepted national and EU standards. While within the rural areas crossed by the railway line, it is good, because of the low road traffic.

Impacts and Mitigation

[20] http://ec.europa.eu/environment/eia/pdf/EIA_guidance_Scoping_final.pdf

[21] National Environmental Agency. State of Environment Report. Annual Reports for 2017 and 2019

Design and Construction phase: Air quality will be affected by construction activities. Impacts are temporary and can be reduced by routine mitigation measures.

Operation: The main source of pollution is the fuel combustion from locomotives that can be mitigated by using fuels within the standards. The future railway electrification will avoid this source of pollution and therefore the air quality will be enhanced.

Conclusion: The air pollution is not a problem of concern and therefore can be reduced to insignificant through routine mitigation measures.

5.2 Noise and vibrations

Baseline information: Official data on annual average noise levels[22] in the densely inhabited urban centres of the project area (Shkoder and Lezhe) show that these levels are slightly higher than the national norms because of the heavy road traffic and other urban activities. As the railway line runs across the neighbourhoods of these cities, where the traffic and urban activities are limited, the noise levels near the railway line are within the national and EU standards.

Impacts and Mitigation

Design and Construction phase: Construction and transport activities will generate noise and vibrations. Impacts are temporary and can be reduced by routine mitigation measures. Particular attention should be paid across the densely inhabited areas (Lezhe and Shkoder), as well as across the shrubby and degraded forest area from km 132+600 to km 137+750.

Operation: Noise and vibration generated during the operation stage are associated with the trains' movement. The noise reduction is firstly performed during the railway design, through reducing them at the source, including the design of the railway line radius curves, and structure and substructure elements. Secondly, the noise levels are reduced at the propagation path through the installation of noise barriers. The ESIA study suggested the railway line sections where noise barriers can be installed, as well as the type of these barriers that are already taken into consideration by the Project's design.

Conclusion: Noise and vibrations during construction can be reduced through routine mitigation measures related to construction and transport activities. While during operation, they are reduced through the appropriate mitigation measures, which are already taken into account in the Project's design.

5.3 Climatic conditions

Baseline information: The project area lies in the Mediterranean Plains Climatic Zone that is characterized by mild and wet winters and hot and dry summers. The only climate parameter that may affect the Project's implementation is the maximum daily precipitation that can reach 200 to 240mm, and therefore flash floods can occur.

Impacts and Mitigation

Design and Construction phase: Schedule construction activities for the construction of the bridges and culverts outside the rainy period.

Operation: The design has taken into consideration the increase of the conveyance capacity of the new bridges (e.g. Ishmi and Droja Bridges) and culverts. Besides, the design has increased the number and the diameter size of the culverts.

[22] National Environmental Agency. State of Environment Report. Annual Reports for 2018 and 2019

Conclusion: The likely impacts associated with climate conditions do not constitute a concern for the Project. They have been taken into consideration by the Project's design.

5.4 Climate change

Baseline information:

Climate change is based mainly on the Third National Communication on the Climate Change (Albanian Ministry of Environment, 2016) and the Fifth Synthesis Report of the Intergovernmental Panel on Climate Change (IPCC), 2014.

The climate change parameters that could be of concern for the Project include the temperature, rainfalls, and sea-level rise.

Temperature: the maximum absolute projected temperature value is 47.5 ^{o}C. It is not expected the minimum absolute temperature value to be lower than the already recorded one (-13.6 ^{o}C). Therefore, the projected temperature increase does not represent any risk for the Project if the Project's components are manufactured to work appropriately in these temperatures.

Sea level rise: In the pessimistic scenario, the highest value of sea level will be roughly 70 cm by 2100. As the lowest part of the terrain crossed by the railway line is roughly 4 m a.s.l. (at Lezhe), it is not expected any impact of the sea level rise on the Project's elements.

Precipitation: The maximum projected 24-hours precipitation values that can affect the Project area could reach roughly 240mm for a return period of 100 years.

Hydrology: The maximum projected increase in runoff values that can affect the Project area could reach 29.5% in the winter period by 2100.

Flooding: The projected increase of runoff could lead to the inundation of the low terrain on both sides of the railway line.

GHG emissions: GHG emissions at the country level are low. The contribution of the transport sector and railway transport to the total GHG emissions at the country level is 26.31% and 0.108%, respectively.

Likely impacts of the Project on the climate change

Design and Construction phase: Impacts are expressed through the vegetation clearing for the working strip that can influence the decrease of the CO_2 capture amount. Vegetation clearing is needed only from km 135+700 to km 137+750, across shrubs and degraded forest. This impact can be mitigated by reducing as much as practicable the working strip. Besides, the cleaned/damaged vegetation will be rehabilitated once the construction activities are done.

Operation: It is not expected any impact on climate change during the operation stage. The main source of GHG is the fuel combustion from locomotives that can be mitigated by using fuels within the standards. The future railway line electrification will avoid this source of pollution.

Conclusion: The likely impacts of the Project on climate change are insignificant

Project design's adaptation to the projected climate change

The only projected climate change parameter to which the Project's design should be adapted is the increase of the intensity of precipitations that will increase the runoff and the flash floods.

The Project's design has already taken into consideration the increase of the runoff values by:

- Increasing the conveyance capacity of the new bridges (e.g. Ishmi and Droja Bridges);

- Improving the protection works against rivers and streams erosion at their crossings and within the sections where the railway line runs alongside their beds (e.g. from km 103 to km 107, where the railway line runs alongside Kiri Riverbed);
- Increasing the number of culverts and their diameter size (e.g. km 32 to 35);
- Improving the drainage channels on both sides of the railway line; and
- Increasing the railway line vertical alignment in the sections where the water flow can overflow the railway line (e.g. section from km 69+500 to km 74+000 has been damaged in 2002 by the combined action of both Lezhe's Drini River and Fangu channel). That is why the design has increased the vertical alignment from km 69 to km 80.

Conclusion: The Project's design has already take into consideration the necessary adaptations to the projected climate change.

5.5 Geology

Baseline information: The main geological risks that can affect the railway line is linked to lithology, tectonics, seismicity, and the water table level. These risks are the subsidence and soil liquefaction during earthquakes.

Impacts and Mitigation: The only risk is subsidence, which may occur where the upper geological layers are composed of unconsolidated marshy deposits (e.g. lowland from km 30+000 to 50+000, km 60+000 to km 68+000, and km 69+500 to km 90+000). The subsidence may affect the stability of the bridges and the railway substructure, because of the weight of the trains.

The appropriate filling material will replace the existing one. Besides, two layers of geotextile will be applied. The design of the bridges' foundations has already taken into account the local geotechnical conditions.

Conclusion: It is not expected any eventual impact related to the geological issues.

5.6 Earthquakes

Baseline information: The railway line crosses an area of high seismic risk. The most sensitive section is from km 90 to km 103, where, the railway runs close to an area where the expected intensity is IX degree MSK-64 (see Figure 7.2 at the end of this document). Recently, two strong earthquakes have hit the Project's area.

Earthquake of April 15, 1979, and the railway line: The epicentre was in the coastal area, in Montenegro. The magnitude was between 6.6 and 7.2 (MSK-64). In Shkoder and Lezhe, roughly 17.120 buildings were destroyed. The ground conditions played a crucial role in the amplification of the earth-shaking. The most affected was the area filled by Drini River with loose alluvial deposits, in which seismic intensity is evaluated of IX degree MKS-64 (see Figure 7.2 at the end of this document). At the time of this earthquake, the railway Lac-Hani Hotit was not yet built.

Earthquake of November 26, 2019, and the railway line: The epicentre was some 20 km in the NW of Vore (see Figure 7.3). The magnitude of the main shock has been evaluated at least 6.4, while the intensity in the epicentre to IX degree (MSK-64)[23]. The earth shake lasted at least 50 seconds. Thousands of buildings within the Project's area (in Vore, Fushe Kruje, Mamurras, Thumane, Milot, Lezhe, etc.) were damaged. Figure 7.3 at the end of this document shows the role of the soil conditions in the amplification of the earth-shaking during this earthquake.

[23] https://www.volcanodiscovery.com/earthquakes/albania/archive/2019-nov-26.html

This earthquake damaged also the Ishmi Bridge, which is currently (December 2020) out of work. Consequently, at present, the whole railway line from Vore to Hani Hotit is not functioning.

Impacts and Mitigation: The earthquakes may damage the bridges. The Project's design has already taken into consideration the seismic risk, which is calculated by taking into consideration the tectonic features, the geotechnical model of the ground, and the water table level.

Conclusion: As the Project has taken into consideration all the necessary seismic parameters in the design, it is not expected any eventual impact associated with the earthquakes.

5.7 Groundwater

Baseline information: The principal urban centres (Shkoder, Lezhe, etc.) and rural areas alongside the railway line are supplied with drinking water through the wells drilled in the aquifers of the area. The Albanian Geological Survey monitors the quality of the groundwater. In general, the quality of the groundwater is within the required national and EU standards.

The most sensitive railway line sections concerning groundwater are as follows:

- *Km 55+500 to km 56+620 (Crossing of Mati Riverbed):* The Mati Riverbed is a recharge area, where the river's water penetrates down and feed the ground waters. The pollution of the soil and surface waters at this location could affect the quality of the ground waters; Mati River feeds the Quaternary gravel aquifer of Fushe Kuqe, where are located the wells supplying drinking water Durres city and other small inhabited areas.
- *Km 107 to km 108 (Northeast of Shkoder):* The railway line runs over a Quaternary Gravel Aquifer, in which water-bearing layers are overlaid mostly by a semi-permeable cover layer. The soil and the surface water pollution may affect the quality of the ground waters; this aquifer supplies drinking water for Shkoder city and its neighbourhoods.
- *Km 130 to km 140 (Malesia Madhe Karst aquifer):* The pollution of the soil and the surface waters may affect the quality of the ground waters, which in turn flow to the Shkoder Lake and therefore the quality of the Lake's waters could be affected.

Impacts and mitigation: The Project design has already avoided the construction of underpasses within the sections that are sensitive to groundwater. The construction activities may pollute the surface water and the soil, which in turn may pollute the ground waters and therefore affect the quality of the drinking water. However, the protection of the ground waters relates to routine mitigation measures for the protection of the surface waters and soil, and therefore the likely adverse impacts on ground waters can be evaluated as insignificant if appropriate mitigation measures are undertaken.

Conclusion: No significant adverse impacts on ground waters and drinking waters are expected if the required mitigation measures are undertaken

5.8 Surface waters

Baseline information: The railway line traverses the rivers of Ishmi, Droja, Mati, Lezhe's Drini, Drini, and Kiri, as well as several small streams. Roughly, from km 139 to km 140 the railway line runs close to the Shkoder Lake, which waters are rather of good quality with a slight tendency to moderate quality. No surface water body that serves for drinking water supply purposes is present in the project area. The quality of the rivers' waters is monitored by several stations located downstream their crossing with the railway line.

Impacts and Mitigation: The potential impacts on the watercourses during the construction stage include increased suspended solids in waters; pollution risk from paints, grease, fuel, and oil spillage, solid waste, etc. No changes in the hydrological regimes of the crossed rivers and streams are expected by the bridges' construction and/or rehabilitation.

If the due general measures of good construction practice for the reduction of potential impacts of discharges into the soil and the surface waters are undertaken, the likely adverse impacts on surface waters can be reduced to insignificant.

Conclusion: No significant adverse impacts on surface waters are expected.

5.9 Flooding

Baseline information: The watercourses it crosses do not flood the railway line Vorë-Hani Hotit. None of the major bridges has ever been threatened to date by the water levels of these watercourses. The base of the railway is elevated at least 2-3 m from the ground. The culverts and small bridges have guaranteed the stability of the railway substructure. However, the lowland crossed by the railway line is inundated during exceptional flood events in the following sections:

- *Km 32 to km 35:* The lowland on both sides of the railway is inundated by Ishmi River. The railway serves as an embankment, which does not allow the water to spread on the lowland. Thus, the land on the eastern side stays for a long time inundated, causing thus damage to the agricultural plants (see Figure 7.4 at the end of this document). The railway line in this section is enough high (almost 3.0m) and therefore it is never inundated, even in the most pessimistic climate change scenario projected by 2100;
- *Km 69+900 to km 74+000:* The land on both sides of the railway is flooded by both Lezhë's Drini River and Fangu drainage Channel (see Figure 7.5 at the end of this document). Besides, the railway plays the role of an embankment that does not allow the water circulation between both sides of the railway line. In the past (winter 2002 – Figure 7.6 at the end of this document) the Fangu Channel has overflowed and damaged the railway.

Impacts and Mitigation: The design has taken into account the increase of the conveyance capacity for all the new bridges and culverts, as well as the increase in number and size of the new culvers to reduce the extent and duration of the inundation of the agricultural lands. As per the most sensitive railway line sections, the design for each of them includes the following:

- *Km 32 to km 35:* The vertical alignment will be increased by up to 70cm in the section from km 30 to km 42, to increase the bridges' conveyance and therefore reducing the possibility that Ishmi River to overflow. Besides, three new culverts (3x2m) will be added from km 32 to km 35;
- *Km 69+500 to km 74+000:* The vertical alignment will be increased by 80 cm in the section from km 72+000 to km 84+500. Besides, two new box culverts have been added within this section. In parallel with the railway line elevation, the design has improved the characteristics of the drainage channels at both sides of the railway to reduce the extent and duration of the inundation.

Conclusion: The Project's design has taken into consideration all the necessary interventions to avoid any potential impact of the flooding of the land on both sides of the railway line. Therefore, the Project will enhance the situation regarding the inundation.

5.10 Biodiversity

Baseline information: In general, the railway line crosses agricultural lands and rural and urban inhabited areas of low biodiversity values. The crossed river and streambeds have limited biodiversity values because of the water pollution (e.g. Ishmi River), the extraction of gravel and sand (e.g. Mati River), the construction of HPP barrages (e.g. Drini River) or the protection works against river erosion (Kiri Riverbed).

From km 132+600 to km 137+750, the railway line crosses degraded forest formations and shrubs (Mediterranean Macchia) that are often split by agricultural plots and pastures. The biodiversity values of this semi-natural habitat are generally limited. From km 139+000 to km 140+000, the railway line runs in between a mountain foot and the Shkodër Lake shoreline. The mountain foot is covered by sparsely Mediterranean Macchia of limited biodiversity values.

The shoreline of Shkodër Lake has the highest biodiversity values compared to other railway sections. However, it should be underlined that from km 139 to km 140, between the railway line and the Lake shoreline runs the motorway connecting Albania to Montenegro. Therefore, it is not expected any direct impact of the Project's activities on this habitat.

Five ecosystems and 60 species represent qualifying features for being assessed as Critical Habitats (CH) in line with PR6. Nevertheless, the presence of some of the qualifying species has not been supported by quantitative data due to the lack of bibliographical information on habitats and species. Most habitats and species triggering the Critical Habitat criteria occur in the protected area of Lake Shkoder.

The proposed project goes through a small part of the Nature Managed Reserve of Lake Shkoder (transit or buffer zone) and is reasonably close to the Landscape Protected Area of Bune-Velipoje, Nature Managed Reserve of Kune-Vain, Nature Managed Reserve of Patok-Fushe-Kuqe-Ishem and Nature Managed Reserve of Berzane. Furthermore, the above areas have several international designations such as Ramsar Site (Shkoder and Bune-Velipoje), Candidate Emerald Sites, Important Bird, and Biodiversity Areas, Key Biodiversity Areas, etc.

As described further in Section 5.22, within and in the vicinity of the Nature Managed Reserves of Shkodra lake it is acknowledged the presence of many Ecosystem Services that seem to be essential to the stakeholders' livelihoods, health, safety, or culture.As a result, the most interesting habitats are the semi-natural habitat of the degraded forest and shrubs and the shoreline of Shkoder Lake.

Impacts and Mitigation: The main source of impacts during construction is the working strip through shrubs and degraded forest. As the railway already exists since 1985, it is not expected any further habitat defragmentation. It is believed that the rehabitlitation would have only minor effects on protected areas and critical habitats and the impacts on biodiversity would be insignificant in case the mitigation and compensation measures are foreseen and implemented correctly.

Impacts include habitat loss, migration of animal populations due to disturbance, etc. The main impact is the loss of biomass (economic value), which should be rehabilitated with autochthonous species. However, the Project foresees to minimize the working strip by using as much as possible the existing motorway and rural roads as access roads. Besides, the working strip will be selected on the railway line side where the vegetation is less developed. While during operation it is not expected any impact.

Conclusion: The Project's design has taken into consideration all the necessary interventions to minimize the effects on biodiversity and therefore the expected impacts can be reduced to low to insignificant in the proposed mitigation measures are undertaken.

5.11 Protected Areas

Baseline information

The railway line runs within or near the Nature Managed Reserve (NMR) of Shkoder L. As shown in Figure 7.7, the motorway Shkoder to Hani Hotit constitutes the eastern border of this NMR. The exact location of the railway line concerning the NMR (see Figure 7.8) is as follows:

- Km 113.3 to km 132.6: the railway crosses agricultural lands and rural settlements within the sustainable development zone on the NMR of Shkoder Lake;
- Km 132.6 to km 135.7: the railway line crosses shrubs and forest within the sustainable development zone on the NMR of Shkoder Lake
- The railway rehabilitation is included in the activities that are allowed by the Management Plan of the NMR of Shkoder Lake, and therefore from the Law on Protected Areas. Figure 7.9 at the end of this document shows the internal zoning of this NMR, while Table 7.1 shows the allowed and prohibited activities in function of the internal zoning, as provided by the management plan[24]. Figure 7.9 shows also that the railway line is located more than 2.5 km from the nearest core zone of the NMR.

Impacts and Mitigation: As the railway line has been built in 1985 while the NMR has been proclaimed in 2005, it is not considered the rehabilitation of the railway line to have significant effects on this protected area. Furthermore, this area has been designated NMR because of the aquatic biodiversity of Shkoder Lake, which is not expected to be affected by the Project.

Conclusion: It is not expected any significant effect on the protected areas

5.12 Land

Baseline information: The railway line from Vore to Hani i Hotit passes through seven municipalities (Vore, Kruje, Laç, Lezhe, Kurbin, Shkoder, Malesi e Madhe). The main part of the land surface required permanently is needed for the service roads (4 ha), Lezhe freight station (1.4 ha) and the improvements of the connectivity roads and level crossings (2.1 ha). While the permanent land surface needed for the increase of the railway line radius is only 0.06 ha. In total, 7.56 ha will be expropriated. The other land surface needed for the service and connectivity roads falls in the existing municipal roads and in the railway belt, which is an Albanian Railways property.

Roughly, 112 km of non-paved service roads are needed for the project. The land surface needed for the service roads is mainly state and municipal land. The land within the railway belt is an Albanian Railway property. The existing local roads that need to be upgraded to serve as service roads are municipal property.

All the stations will be rehabilitated within the Albanian Railways land property. While the planned new freight station in Lezhë will be located partly in Albanian Railways property (the railway belt belongs to HSH) and partly in private agricultural land.

The LARF preliminary assessment indicates that no physical displacement will occur and the main impact is on land aquisition. The total disturbed land area affects in total 1,727 land parcels, which ownership at present is not identified (whether these land parcels are private or public properties). Additional land may be required by the contractor for construction works, borrow pits, landfills, storage areas, etc. which are expected to result in temporary land acquisition only.

[24] https://www.iucn.org/sites/dev/files/content/documents/shkodra_managing_plan_alb_final.pdf

The percentage of land to be expropriated in relation to the whole property is yet to be calculated. Nevertheless, the railway follows the railway right of way (railway belt) and widens into private land at a range of 0-4 meters maximum. Expropriation will impact the fences, yard walls, and thin strips of the yard in the houses and businesses at the urbanized areas of the railway line. The preliminary assessment also indicates that approx. 13 auxiliary structures (most of them informal) might be affected by the Project. The presence/absence of these auxiliary structures will be validated during assets inventory preparation and the expropriation study, at the stage of Resettlement Plan preparation.

Impacts and Mitigation: Permanent land acquisition cannot be avoided. The mitigation measures consist mainly of the optimum use of the existing local roads as service roads and designing any new underpass whether it is allowed by the topography.

To avoid impact on the household, and to protect the existing houses and infrastructure, the technical team has foreseen the construction of retaining walls nearby the inhabited areas, where needed, at a total length of 1.8km as defined in the Detailed Design.

The prepared LARF specifies the procedures that shall be followed and the actions that shall be taken to mitigate the negative impacts on land acquisition and any possible impacts on physical or economical displacement.

Conclusion: The permanent land acquisition requires roughly 7.56 ha. LARF document is already prepared and a preliminary assessment is done. At this stage of the project's development, there is no detailed information from the cadastral agency. Therefore, the names of the affected private landowners are not yet known. HSH will collect all the missing information and based on the LARF indications and in compliance National Laws and with EBRD Environmental and Social Policy (2019) the HSH should prepare and implement a detailed Resettlement Plan.

5.13 Soil and Soil quality

Baseline information: Soils alongside the railway line route were assessed from the pedologic and agricultural production. The quality of the land from the agriculture production point of view can be classified as very good, good, average, low, and scarce land.

For the proposed project it should be taken into consideration the following:

- The soil of good quality is encountered approximately from km 30 to km 93;
- Scarce land is encountered mainly from km 130 to km 140. These soils are mostly inappropriate for agricultural purposes.

Impacts and Mitigation: Soil quality is affected by construction activities (compaction, loss of topsoil, vegetation clearing, etc.). Mitigation measures include the use of the local roads as access roads, minimizing the working strip; remove the topsoil within the areas of the new service roads and stations, etc. No impact is expected during the operation phase.

Conclusion: If appropriate mitigation measures are undertaken, the likely impact on soil and soil quality can be reduced to low significance.

5.14 Infrastructure

Baseline information: Infrastructure includes all utilities that cross or run very close to the railway line, and therefore constitute a risk for the Project's implementation and vice-versa can be adversely affected by the construction of the railway line. Infrastructure includes gas and water supply pipelines, aerial and underground power and telecommunication, and power substations and cabins. During site visits and consultations with the affected municipalities, and

the power operators (OSHE and KESH), the Consultant has identified 110, 220, and 400 kV power lines. No intersection with any transmission water supply pipeline has been identified so far.

Impacts and Mitigation: Any necessary infrastructure utility that can be damaged by the Project should be removed and reinstalled appropriately. However, impacts on infrastructure are temporary and can be mitigated.

Conclusion: The infrastructure utilities that should be taken into consideration during the Project's implementation stages include only power lines. No intersection with any transmission water supply pipeline has been identified.

5.15 Landscape and visual issues

Baseline information: From Vore to Bajze the landscape is generally characterized by open fields covered mostly by agricultural land and numerous farmhouses. The most scenic landscapes along and near the railway line are found within the northern part of the railway line, as follows:

- Shkodër Lake and its shoreline;
- The flat karst area in the segment Aliaj to Hoti Village (km 129+000 to km 138+800), where several landforms are found;

Impacts and Mitigation: As the railway already exists, there is no expected any additional permanent adverse effect on the landscape, excepting the construction of the new Lezhe 2 station in a flat agricultural area, the fencing, and any eventual noise barrier. Where possible, the Consultant suggests the installation of transparent noise barriers.

Besides, the visual aspect of the new stations' buildings, the improved and secured level crossings, and the newly improved service roads, bridges, underpasses, and drainage channels will be much better compared to the existing ones

Conclusion: In general, the landscape and visual issues will be affected negatively only by the presence of the new Lezhe 2 freight station in an agricultural area. Whereas all the other components of the railway line will improve the visual amenity.

5.16 Cultural heritage

Baseline information: The wide Project's area is very rich in cultural heritage. Especially Lezhe and Shkoder regions include a high number of historical and archaeological sites. However, the number of cultural monuments and sites close to the railway line is very restrained. The closest cultural heritage objects/sites to the railway line are as follows:

- Historical Catholic cemetery of Rmaji, Shkoder, that is located 10m from the railway line;
- The ancient Lezhe town, which archaeological area, as defined by the DCM 728/2010[25], is located 160 m from the railway line, on the opposite side of Lezhe's Drini River.

Impacts and Mitigation:

The majority of the project impact will be a direct impact occurring during its construction phase, including topsoil stripping of the construction areas, movement of heavy machinery, excavation of the cable trench and reinstatement. Other impacts may include temporary compounds, borrow pits, and access zones, the exact location and extent of which are not yet known.

[25] On the proclamation of archaeological zones A and B of Lezhe city and the approval of their management

Consequently, the potential impacts of the project on cultural heritage may be characterized as follows:

- There is no formally known cultural heritage site/object within the railway line, stations, and service road sites' locations. Thus, the potential impacts as low.and
- Based on the existing cultural heritage, the history of Lezhë, Shkoder, and Malësia e Madhe territories, and on the geographical features of this area, it is expected that there is a medum potential for unknown archaeological sites/ if any ground breaking activity occurs outside of the project footprint.
- The potential impact for noise, vibration and dust for the ICH Catholic cemetery is high and appropriate mitigation will be needed in stakeholder consultation with the community.

As a conclusion, the potential impacts on the formally known cultural heritage can be evaluated of low. There is a high potential impact for the ICH Catholic cemetery. The possibility that the construction work may uncover encounter chance finds during work should not be discounted.

It is recommended archaeological monitoring is undertaken during any groundbreaking activities and should be included as an integral part of the development process of this project. A cultural heritage management plan CHMP should be implemented in advance of construction with a Chance Find Procedure which will be implemented for the Project construction activities.

5.17 Waste

Baseline information: There is no environmental hot spot within the fingerprint of the Project's area. The only waste is constituted by the neglected existing building facilities in the passengers and (overall) the freight train stations contain solid waste such as bricks, stones, etc.

Impacts and Mitigation: The main source of waste generation is the demolition of the existing bridges, culverts, and stations, which will generate a considerable amount of solid waste. The removal of the rails and sleepers will produce metallic, concrete, and wood waste. Another source will be the construction activities (earth and concrete works, electro-mechanical works, installation works, etc.).

The Project design has planned to reuse all the existing railway substructure filling material, which will be mixed with another one (crushed limestone) and will be reused to fill the railway substructure. The concrete waste that will derive from the demolition of the existing bridges will be reused to fill the railway subgrade on both sides of the new bridges. The concrete slippers also will be reused in the filling of the railway subgrade on both sides of the new bridges when the vertical alignment will be higher than the existing one because of the increased conveyance of the planned new bridges.

Whether the solid waste cannot be reused by the Project, it can be used for different other purposes, in collaboration with the local governments. The Municipality of Malesia Madhe proposed to use the concrete waste pieces for protection against erosion in the streambeds. In general, the solid waste that can be reused neither by the Project nor by the local governments will be disposed of at the disposal sites defined by the municipalities.

Conclusion: Waste generation will be significantly reduced but not completely avoided. A part of the solid waste will be transported at the municipal waste disposals.

5.18 Occupational and Community Health and Safety

Baseline information: Health and safety issues are connected with both workers employed in the construction of the railway, but also with the communities situated in the proximity of the railway line. The areas where the project crosses are well connected to the health services, although the quality of this service is better within the hospitals or in health centers in towns.

Impacts and Mitigation

Design and construction: The sources of impacts are connected with the operation of machineries, handling of concrete pieces and rails, working in confined space for the workers. While for the communtiies is related to the increase of traffic, emission of dust, emission of noise and vibration and influx of workers in the area.

During this phase, mitigation measures has been taken into consideration for avoiding and minimazing the above indicated impacts as follows:

- Implement a Traffic Management Plan;
- Implement an Occupations Health and Safety Plan;
- Plan transportation routes in consultation with Municipalities, road department and Police;
- Plan and implement awareness campaigns on risks related to the traffic increase, especially in the schools present in the area;

In the operation phase the impacts are related to the railway accidents and incidents and overall operation of the railway line, which are explained below.

In addition, during the operational phase electrification of trains will put more pressure on the electric power supply and diversions of utilities on local businesses and communities. In order to minimize negative impacts, the following measures will be taken before and during operation:

- Adequate electrification of railway to be done in order to avoid lack of electricity in the area.
- Adequate strengthening of the local electrical grid to support the electrification of railway and avoid any reduction in the availability of the communities/businesses to electricity in the area.

Maintenance activities of the trains/track or electrification system, which may potentially result in impacts such as on the occupational health and safety for the workers that will perform regular maintenance of the railway and public safety during the maintenance.

Conclusion: The adverse impacts associated with occupational health and safety may be evaluated of low probability and significance and local extent if the related national standards and legislation and the best international practices are applied.

5.19 Railway accidents and incidents

Baseline information: The accidents are associated overall with the unauthorized level crossings and at a lower scale to the crossing of the open line. While the trains' incidents derive mainly from the deterioration of the condition of the lines, the railway vehicles, the insecure railway switches, and on a lesser scale to the human errors of the railway staff[26].

[26] http://dih.gov.al/attachments/article/633/DIH%20%20%20ANNUAL%20REPORT%20%202019.pdf

Impacts and Mitigation: The Project's design has already taken into consideration the applicable standards on the secured level crossings, the closure of the informal crossings, the fencing of the railway line and stations, as well as on the new signalization system will avoid any eventual train collision and other accidents. All these elements (level crossings, fencing, signalization, access to vulnerable people, implement awareness campaigns on risks related to the traffic increase, especially in the schools present in the area; etc.) will be appropriately built and maintained during the whole operation phase.

Conclusion: Accidents and trains' incidents will be drastically reduced if the related national standards and legislation and the best international practices are applied.

5.20 Compliance with other plans/programs

Baseline information: This section includes other existing plans/programs/projects within the same project area and/or the same sector (infrastructure and transport), in combination with which the proposed project may cause cumulative impacts.

The rehabilitation of the railway line is included in all the existing urban and transport national and municipal development plans, and therefore do not contradict these plans. Consequently, no significant adverse cumulative impacts are expected to occur. The Project is included in the category of activities that are allowed by the Management Plan of Shkoder Lake Protected Area.

The Project's design has already taken into account the railway line crossing with the planned Adriatic – Ionian Corridor (AIC – a road project) at km 40+343; the Ionian Adriatic gas Pipeline (IAP), at km 38+800; and the eastern bypass of Shkoder, at km 102 +500 and km 105+100.

Impacts and Mitigation: The crossing with AIC, IAP, and Shkoder bypass do not cause any negative effects if the required standards related to such intersections are applied.

Conclusion: No adverse cumulative impact is expected.

5.21 Socioeconomic issues

Baseline information: Socio-economic baseline serve to determine the current social and economic conditions of the inhabited settlements along the railway alignment and to evaluate how these conditions will change from project development.

The railway line affects seven towns and 63 villages[27], a part of them crossed, bypassed, or located close to the railway alignment. The overall population in the project area of interest is 273,882 inhabitants as per Census 2011. No representatives of Roma and Egyptian communities live nearby or are adversely affected by the Project.

Unequal treatment of women, including harassment and social marginalization, exists throughout the country and are fundamental problems that can influence such infrastructure projects. Hereupon, in these conditions, women may be less able than men to enjoy their right to non-discrimination. Regarding to employment, women are less likely to participate in the labour market. There is also a violence against women and girls which occurs in various forms, such as physical, sexual, psychological, and economic.

Impacts and Mitigation

Design and construction: The sources of impacts include the demolishing and construction and transport activities, traffic, permanent and temporary land acquisition, an influx of temporary workforce, etc. The likely impacts include disturbance from traffic and noise, temporary land

[27] Vore – Hani i Hotit is an existing railway line, therefore presence of settlements has been considered mainly in terms of the impact that the railway rehabilitation will bring to the movement of people, vehicles and animals.

use restriction, eventual tensions that may arise from any eventual temporary land acquisition and loss/damage to livelihood, etc. These impacts are temporary and can be avoided/mitigated by applying due strategies and measures.

The Project design has taken into consideration that the authorized level crossing and parallel service roads have considered the population movement to reach centres of administrative units, secondary education facilities, and health centres.

In addition the project will implement mitigation measures that will minimize the negative effects related to socioeconomic issues:

- Compensation to land owners and land users is provided prior to commencement of works;
- Maximize employment opportunities from the areas crossed by the project;
- Provide employment opportunities for women headed households and vulnerable groups;
- Maintain open access and crossing points to sensitive receptors like schools and health care centers;

Operation phase: The rehabilitation of the railway line will affect positively the following:

- Significant regional positive impact because of the national rail network connection to the regional and European railway networks through Corridor X;
- The increase of the importance of the port of Durres;
- Stimulation of the growing industries (cement, minerals -chromium, copper, iron, etc.);
- Creation of opportunities for the increase of business at a national level and therefore increase in employment and incomes;
- Promotion of public transport, including the attraction of car users to public transport;
- Access of disabled persons to stations has been considered and new building stations and the ones to be reconstructed foresee access and parking spaces for disabled;
- Contribution to urban restructuring, shortening travel distances and improving cities sustainability;
- Linking by rail the main economic nodes of the country; etc.

Conclusion: The overall socio-economic environment will be improved at a local, national, and regional level.

5.22 Ecosystem Services

Baseline information: The Baseline study identified the ecosystem services that could be impacted, directly or indirectly, by the project. This relates to the ecosystems on which project-related restrictions (e.g., land acquisition, change in land use) could prevent the users from deriving benefits from these ecosystems. Based on desktop-collected data, the presence of ES is mainly assumed within or in the vicinity of Nature Managed Reserves, and the ESs seem to be important to the stakeholders' livelihoods, health, safety, or culture.

Impacts and Mitigation

The railway project may affect the ecosystem services in the Lake Shkoder area, as the railway traverses the Nature Managed Reserves, and their habitats. The working strip may reduce the forest and shrub habitats (loss of biomass as economic value), and other natural habitats used by the local communities. Degraded Forest formations dominated by a mix of deciduous oak species (km 132+500 to km 137+750); likely significant impacts are recognized to be vegetation clearing, temporary habitat loss, migration of animal populations due to disturbance, the introduction of invasive species, etc. The project may also affect the quality of water resources, lake's ecosystem and natural resources and the preservation of the ecological and cultural values of the protected areas. The railway line crosses the forest and shrubs, and The main impacts on the local ecosystems occur during the construction period.

Main mitigation measures will include establishing alternative access to maintain accessibility where alternative grazing and medicinal plants areas are located, control of railway construction to ensure downstream water supply and quality changes are minimized and do not disrupt grazing quality and disrupt vegetation cover outside of the construction areas, and reinstatement of temporary disturbed areas during construction will include reprofiling and re-vegetation.

Conclusion: The potential impacts on the ecosystem services can be evaluated of medium probability, of low to medium significance, and regional extent.

6 Main Findings

This chapter summarizes the main findings of the ESIA report that are associated with the selected Project's option.

6.1 Considered Project's options and preferred option

Two Project's options are considered:

- Option 1 (Basic option): construction of 54 secured level crossings;
- Option 2: (Expensive option): construction of 32 new overpasses and 22 secured level crossings

Option 1 (Basic option) is the preferred option from the environmental and social point of view (see section 2.2.3). Besides, the Project's promoter for financial and environmental reasons prefers it also. Consequently, the assessment of the expected environmental and social effects that may arise from the implementation of the proposed project relates to the "basic option".

6.2 The Project and the crossed Shkoder Lake Protected Area

Although the railway line crosses a protected area (the Nature Managed Reserve of Shkoder Lake), the railway rehabilitation is included in the category of interventions that are allowed by the Management Plan of this NMR, and therefore from the Law "On Protected Areas".

6.3 Expected significant effects of the Project

The expected significant effects are the residual ones, which are associated directly with the project elements and activities or indirectly to the interaction between the project and other development plans/programs in the same project area or the same sector (transport).

6.3.1 Expected negative effects

The main adverse impacts are expected to occur during the preconstruction and construction stages. Some of them are reversible once the construction works are done. Other last sometime after the construction period.

The main expected adverse impacts are grouped in permanent and reversible ones.

Main expected residual negative effects

The ESIA study aims to assess the potential significant adverse impacts of a project before the project is approved. Besides, it takes into account the stakeholders' concerns in the environmental decision-making process during the whole project's life cycle.

The main expected permanent negative effects concern the land use and the landscape.

Permanent land take is necessary for 112 km service roads, the new Lezhë2 station and the connectivity roads. The main part of the required land surface falls in the existing local municipal roads and in the railway belt. Thus, only roughly 7.5 ha falls in private agricultural land. Anyway, the loss of 7.5 ha of land is justifiable compared to the positive effects that the Project will bring at national and local level.

The presence of railway line fencing and any eventual noise barrier will affect the landscape and the visual amenities.

Main expected temporary negative effects

Some of the temporary adverse impacts are reversible once the construction works are done. Other last sometime after the construction period.

The main temporary adverse impact can be considered the eventual damages to the shrubby and degraded forest area in the section from km 132+600 to km 135+600. This impact is temporary and reversible, but the rehabilitation of the vegetation requires due time.

6.3.2 Expected positive effects

Expected significant permanent positive effects

The expected significant residual positive effects related to the biophysical and socioeconomic factors.

Expected significant residual positive effects related to the biophysical environment

The expected significant residual positive effects related to the biophysical environment include:

- Avoidance of the damages to the railway line from watercourses overflows (approximately from km 69.9 to km 74);
- Avoidance of the agricultural land inundation (km 32 to km 35; km 69.9 to km 74);
- The stations' buildings and platform canopies will fulfil the EU standards on energy efficiency and "green buildings";
- The design of the new stations' buildings will improve the visual amenity compared to the existing ones;

- Decrease of the GHG emissions from the railway line and stations operation;
- Reduce the railway noise and vibrations

Expected significant positive effects associated with the socio-economic environment

The main expected positive impacts occur overall during the operation stage. This category of impacts include:

- Enhancement of the economic situation of the country as a result of the railway line operation;
- The design of the railway line components will avoid/reduce at maximum any eventual damage due to earthquakes and therefore will avoid any eventual railway traffic interruption;
- Avoiding/reducing at maximum the railway line accidents and incidents;
- The railway infrastructure at the stations and level crossings will be adapted to disabled persons, children, etc.;
- Avoid/reducing the economic losses from agricultural land inundation;
- Improvement of the traffic as a result of the improvement of the level crossings and the service and connectivity roads;
- Create conditions for linking with the future railway line to Kosovo; etc.

Main expected temporary positive effects

The main temporary positive impacts last only during the construction stage. They include:

- Temporary creation of employment from the recruitment of the local workforce and the stimulation of the local service sector for the need of the construction company;
- Engagement of the local construction companies, and therefore increase of their incomes.

6.4 Overall finding

Based on the findings of the environmental and social comparison between the existing situation and the basic option (see section **Error! Reference source not found.**) it results that the Project will enhance the existing overall environmental and social situation.

7 Maps and Figures

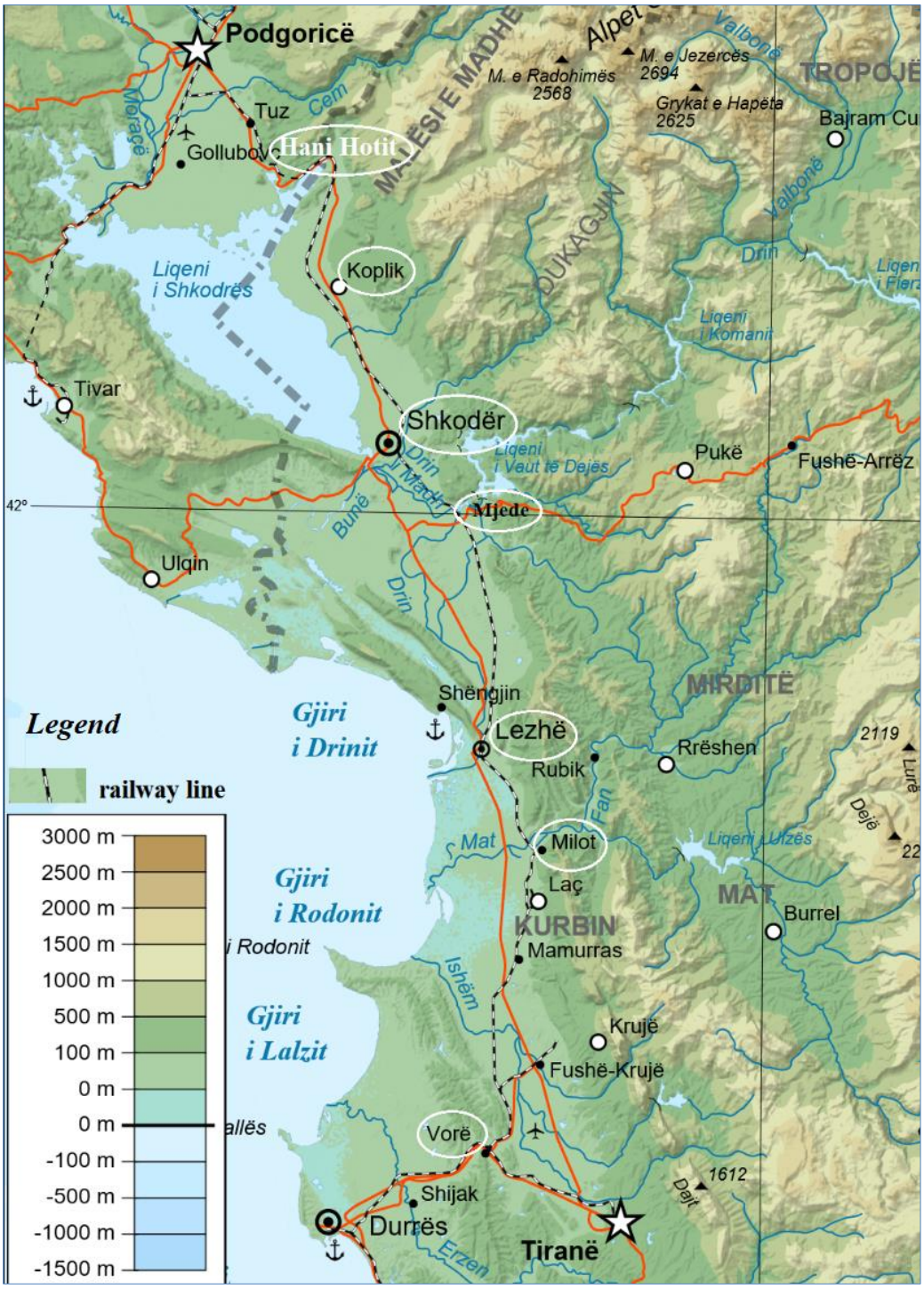

Figure 7.1_General location of the railway line and the main urban centres

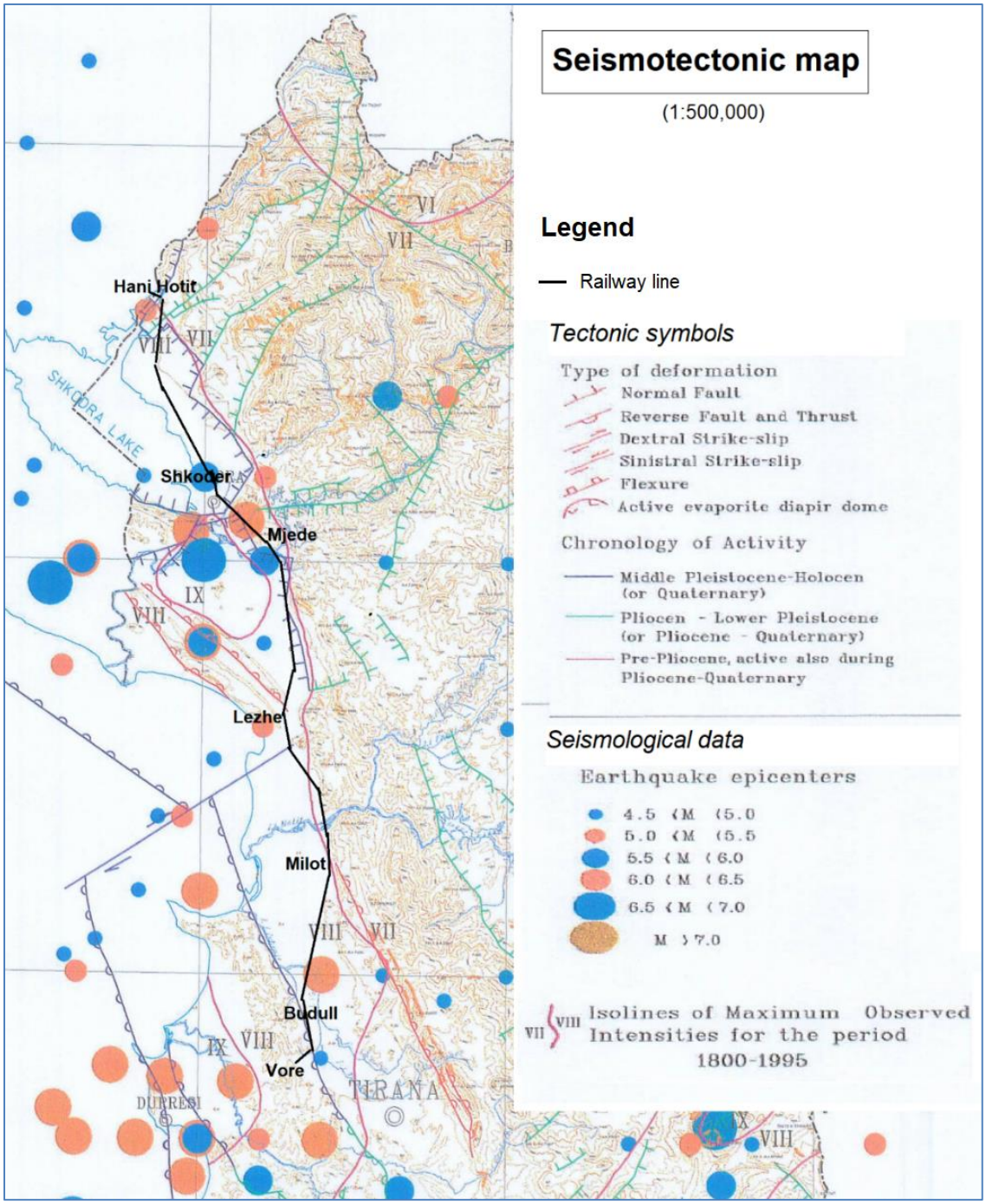

Figure 7.2_Seismotectonic map of the Project's area

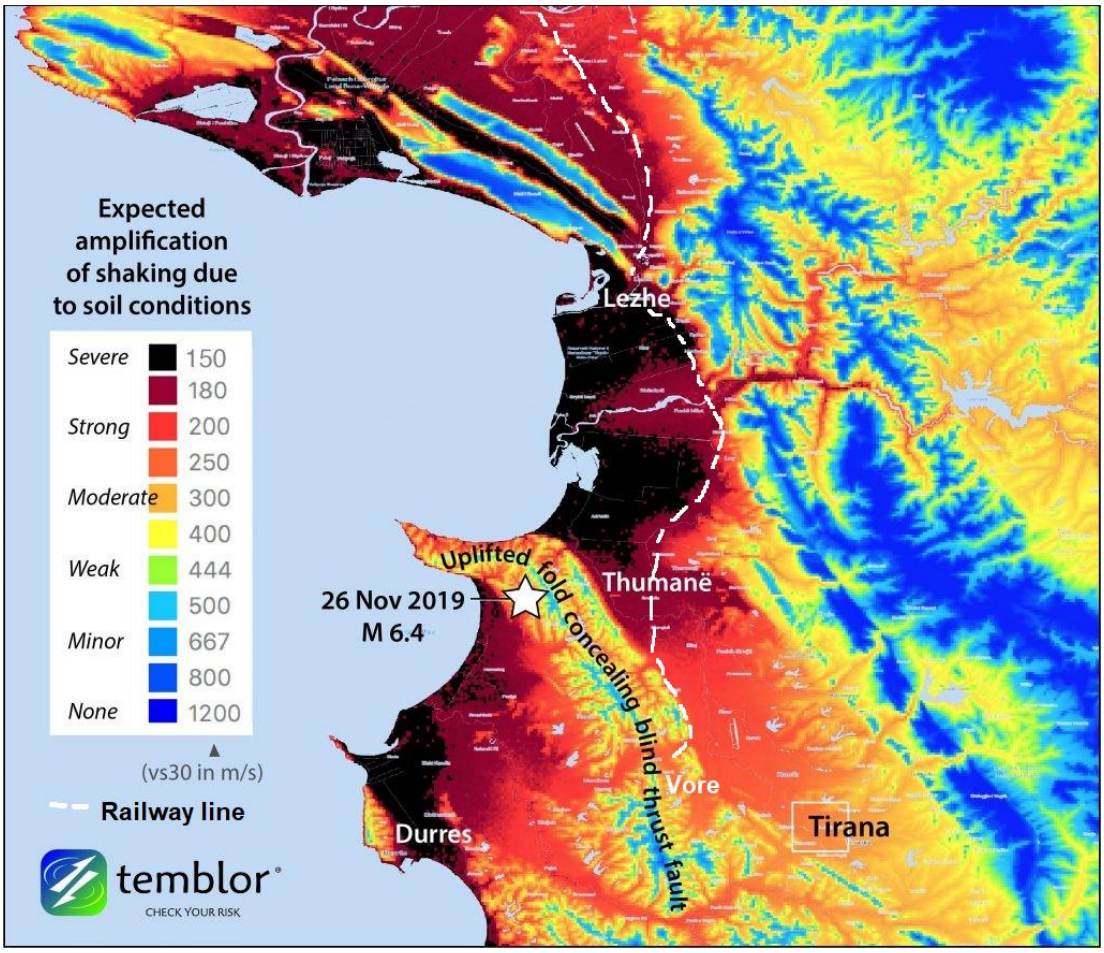

Figure 7.3_Amplification of the earth-shaking due to soil conditions

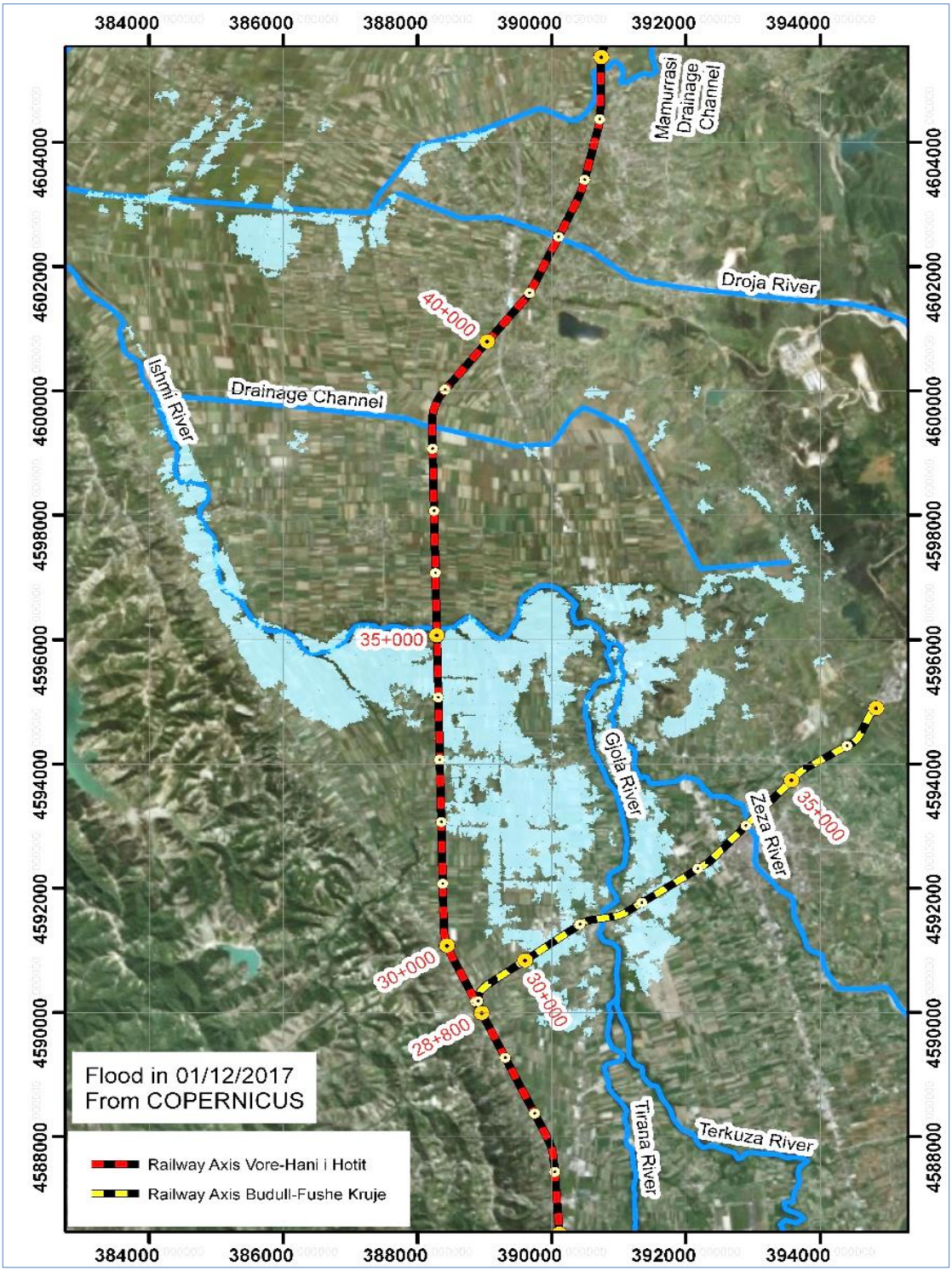

Figure 7.4_Area flooded by Ishmi River on December 12, 201728

[28] https://emergency.copernicus.eu/mapping/ems/copernicus-emergency-management-service-monitors-impact-floods-albania

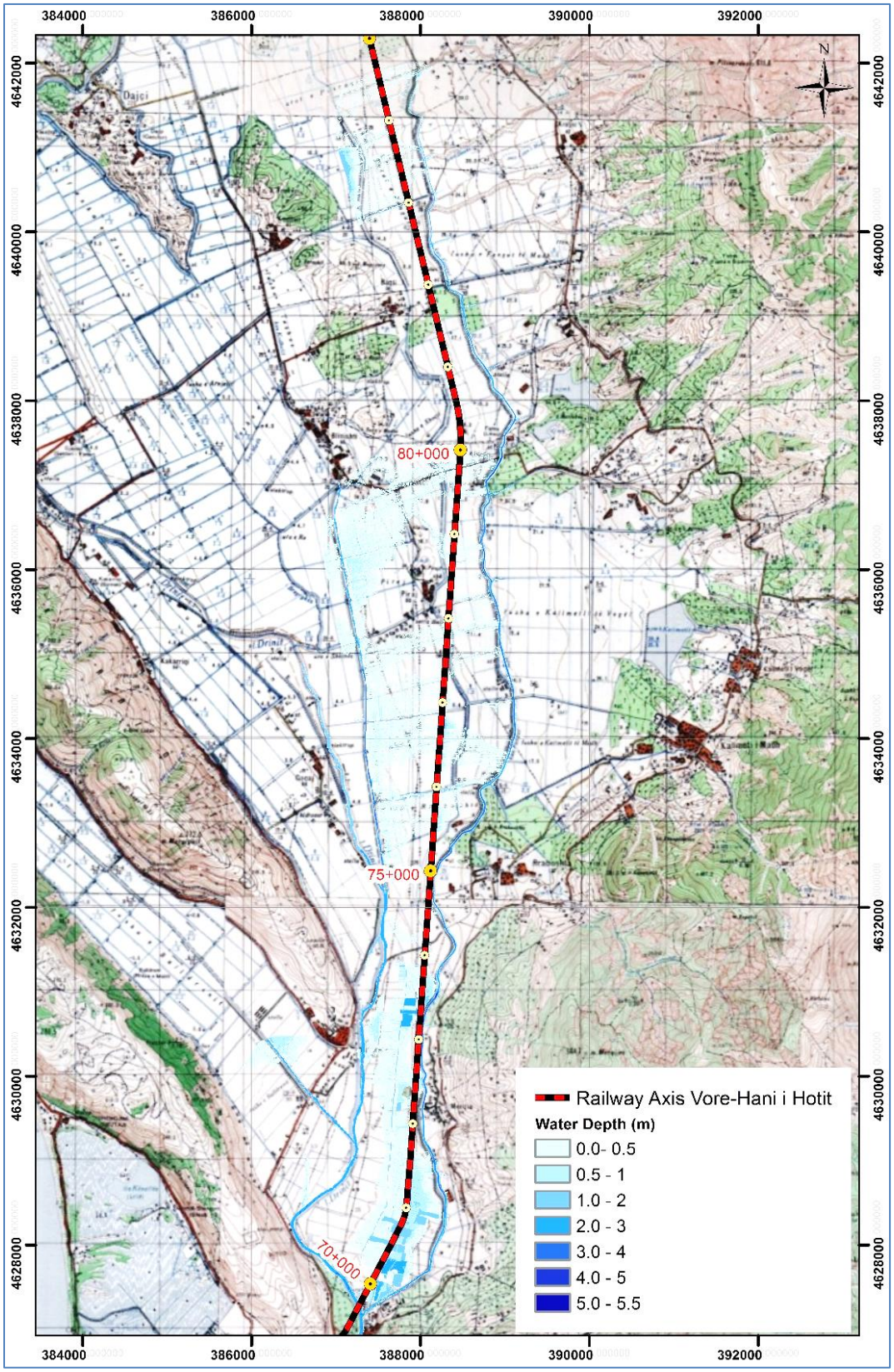

Figure 7.5_Map with Flood Depth caused mostly by Fangu Channel

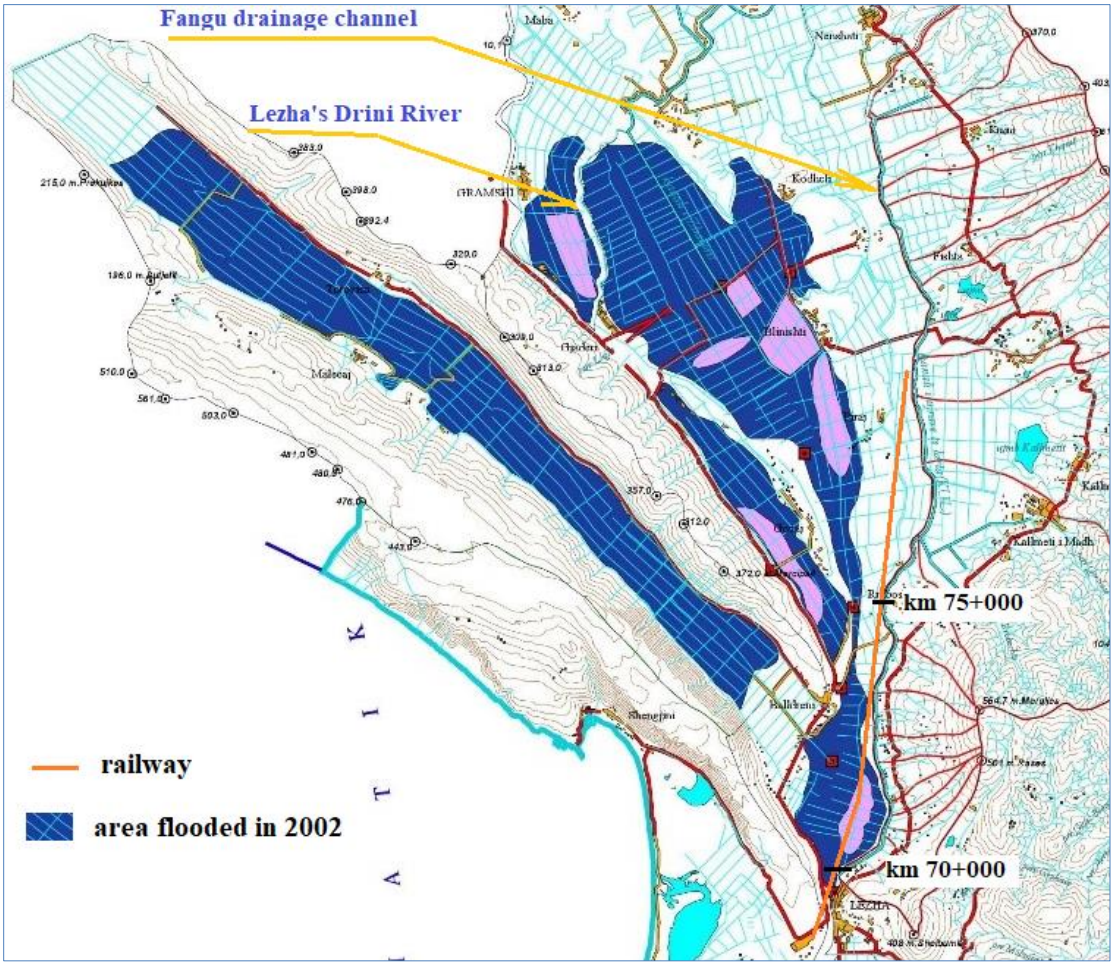

Figure 7.6_Railway section from km 69.8 to km 73, flooded in 2002 (source IHM)

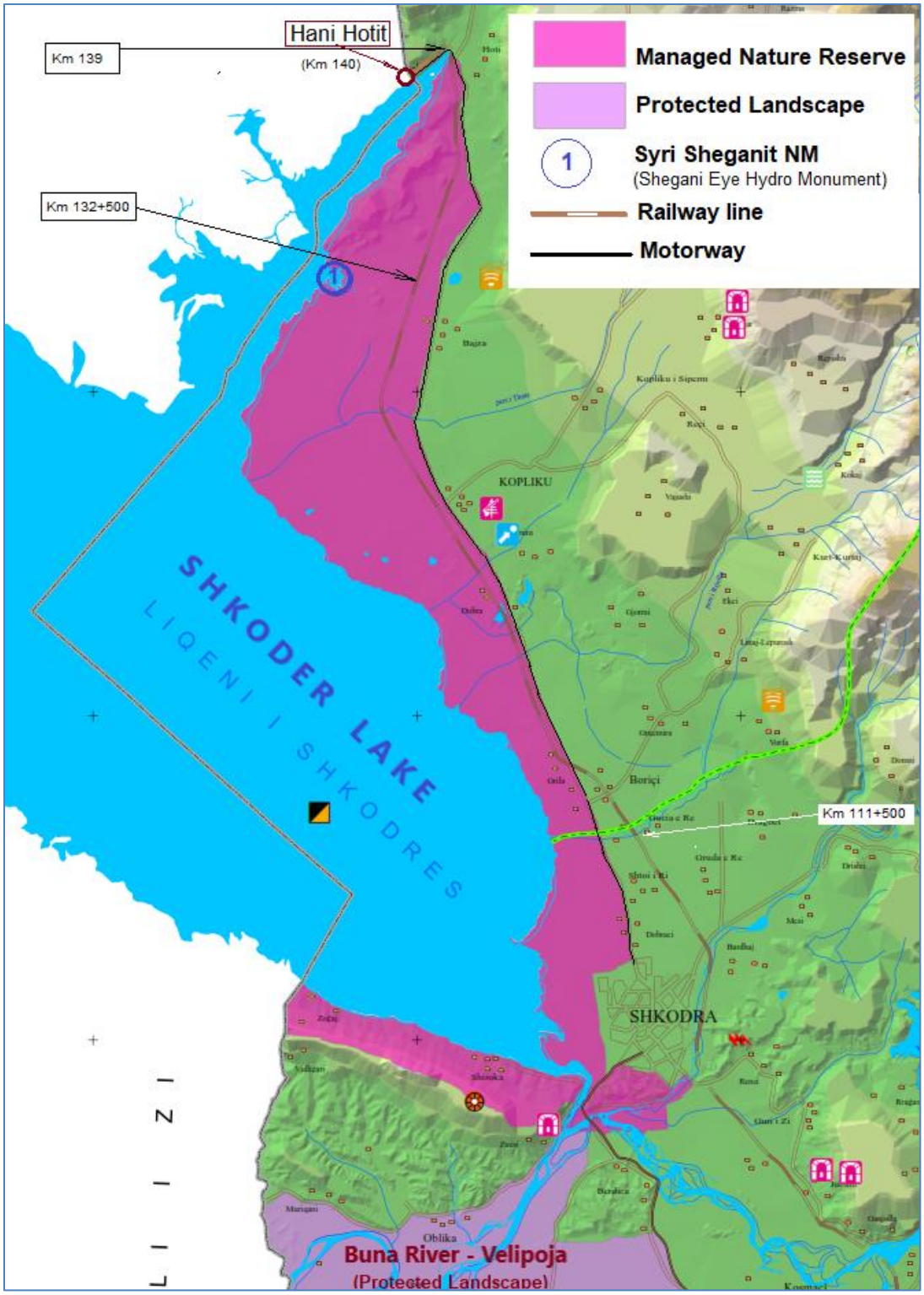

Figure 7.7_Nature Managed Reserve of Shkoder Lake29

[29] Source: Shkoder Regional Agency of Protected Areas, 2020

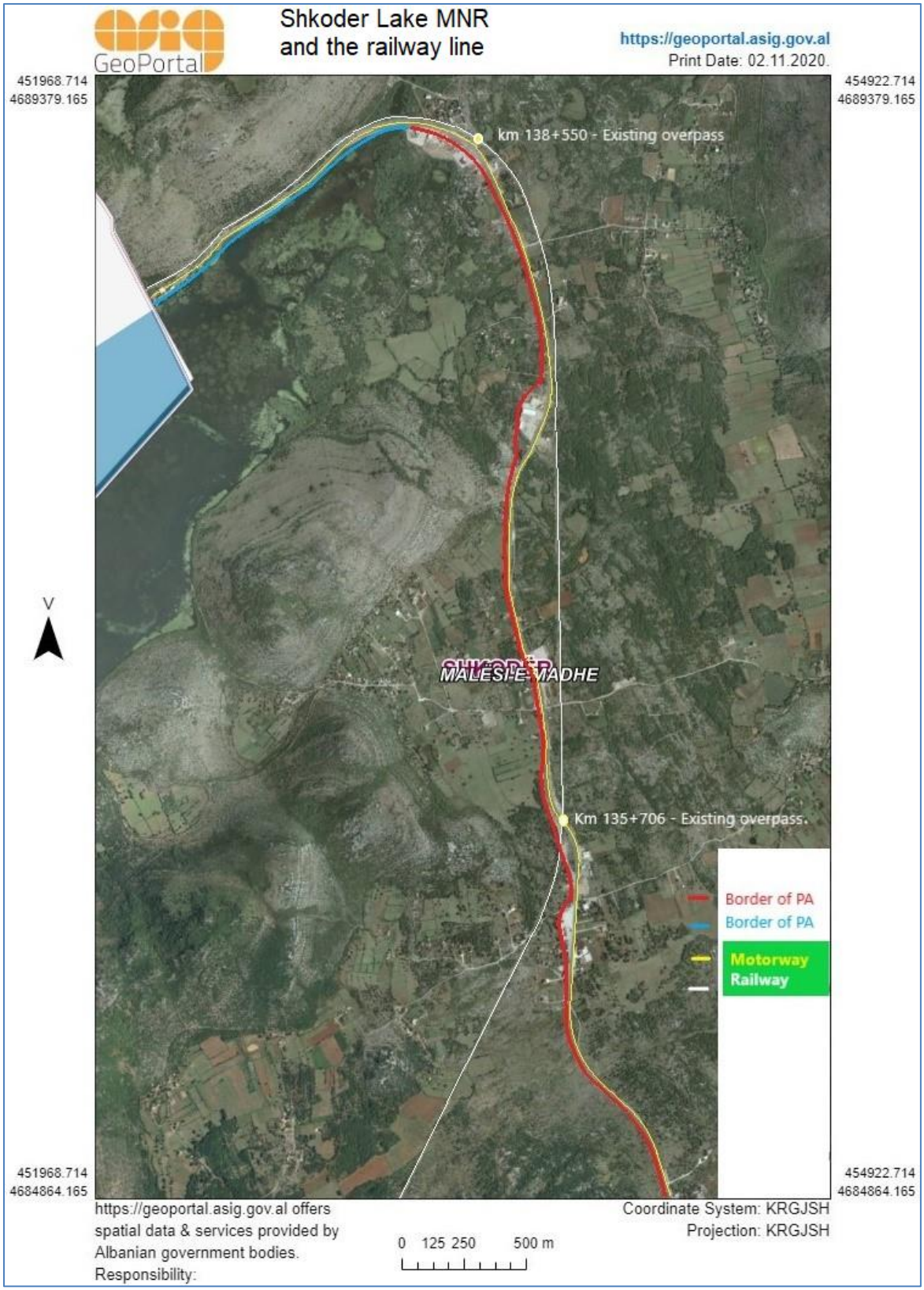

Figure 7.8_Eastern border of Shkoder Lake MNR and the railway line

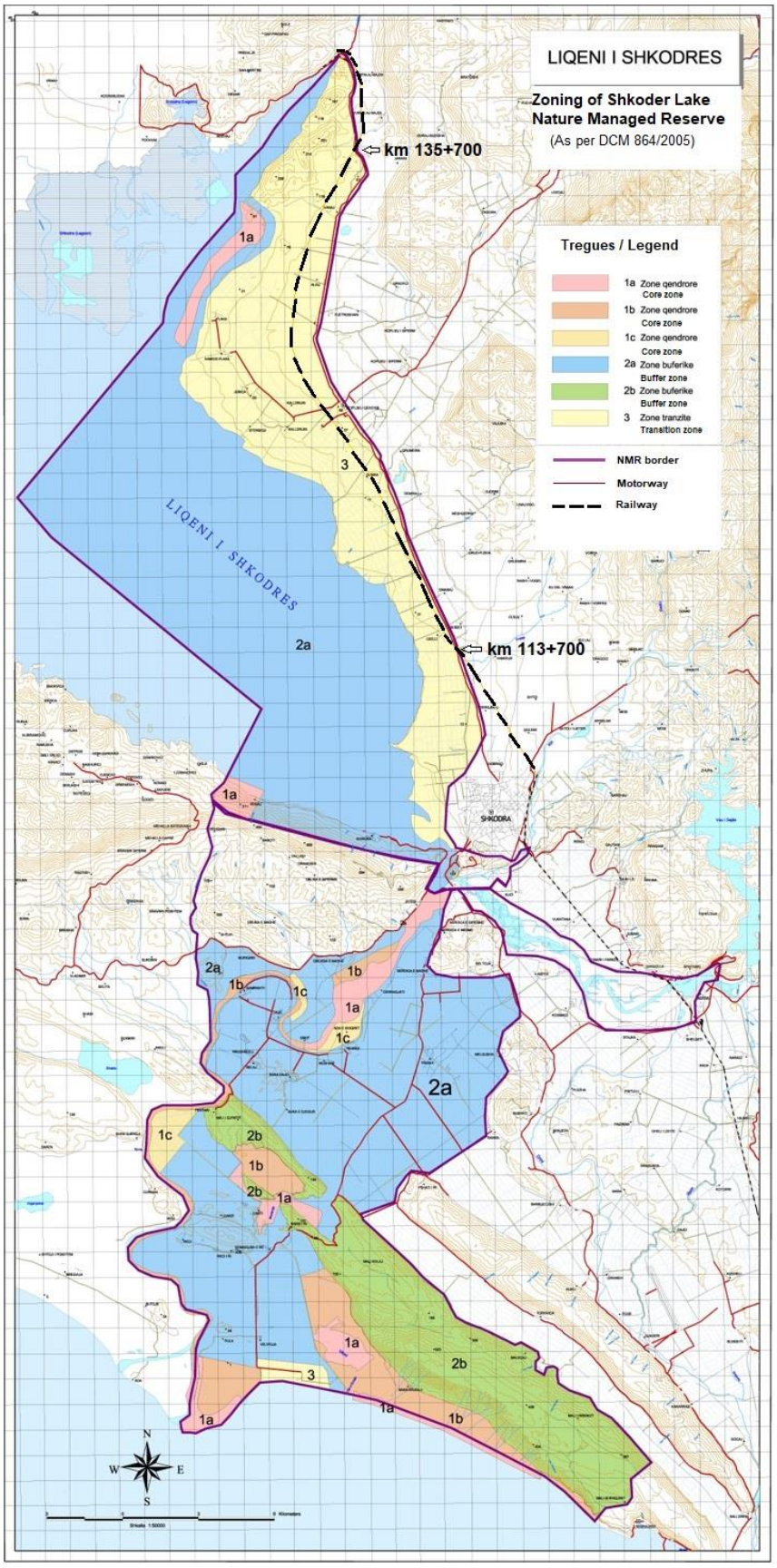

Figure 7.9_Internal zoning of the NMR of Shkoder Lake according to the DCM 864/2005

Table 7.1_Activities allowed and prohibited by the Management Plan of the NMR of Shkoder Lake

No	Activity (as per the Management Plan of the NMR)	Internal zoning (as per the DCM 864/2005)		
		Core zone	Habitats Management zone	Sustainable management zone
		Allowed or prohibited activity (as per the Management Plan of the NMR)		
1	Scientific reschearch (with a permit)	Yes	Yes	Yes
2	Hiking (along the marked trails)	Yes	Yes	Yes
3	Horse/mule/donkey riding	Yes	Yes	Yes
4	Motor vehicles (on the existing roads)	No	Yes	Yes
5	Sailling/motor boats	No	Yes	Yes
6	Camping (in the designated places)	No	Yes	Yes
8	Campfire (in the designated places)	No	Yes	Yes
9	Collection of wild animals and plants	No	Yes	Yes
10	Grazzing (with a permit)	No	Yes	Yes
11	Traditional agriculture	No	Yes	Yes
12	Wood harvesting	No	Yes	Yes
13	Commercial/subsistence fishing	No	Yes	Yes
14	Recreational fishing	No	Yes	Yes
15	Hunting	No	No	**No**
16	Building of soft-tourism infrastructure (trails, shelters, information boards, etc.)	Yes	Yes	Yes
17	Construction of new tourist facilities	No	Yes	Yes
18	**Construction of new roads**	No	Yes	**Yes**
19	**Reconstruction of existing buildings**	Yes	Yes	**Yes**
20	**Reconstruction of existing roads**	Yes	Yes	**Yes**