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

APPENDICES

July 2021

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 Report

APPENDICES

Version	Date of issue	Contributors	Checked out	Approver	Comment
V.01	Dec. 2020	ESIA team	Hector Martinez	Aristides Karlaftis	Draft for comments
V.02	July 2021	ESIA team	Hector Martinez	Aristides Karlaftis	Final document

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

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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	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
ESMS	Environmental and Social Management System
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
GAP/COMMENT	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	Hydro power 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

Abbreviation	Description
IUCN	International Union for Nature Conservation
Kos	Kosovo
LUCF	Land Use Change and Forestry
LRF	Land Resettlement Framework
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
RAP	Resettlement Action Plan
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
SEA	Strategic Environmental Assessment
WB	World Bank
WBIF	Western Balkans Investment Framework
WFD	Water Framework Directive

GLOSSARY

Baseline	An outline 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 P/P.
EIA	Environmental Impact Assessment, undertaken at the project level. The EIA for the eventual selected PIP (Performance Improvement Plans) projects is undertaken, if necessary, based on the SEA findings and on the environmental regulations.
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 a SEA. 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 own 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 of 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

[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

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
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 have 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 ground water bodies/aquifers.
Responsible Authority	Called also Project/plan developer, a public body responsible for a P/P. The responsible authority for the railway is MIE.
DWG (Designated Work Group)	Document formats for creating, processing and presenting graphic information.

[5]http://www.mjedisi.gov.al/files/userfiles/VNM_Paraprake/Fletorja_Zyrtare_101-2011_-_Ligji_nr_10440_date_7_7_2011_-_Per_Vleresimin_e_Ndikimit_ne_Mjedis_%28VNM%29.pdf

1 Appendices related to chapter 1

1.1 Appendix 1.1: National Environmental Agency opinion on the Project

The Albanian Railways requested the opinion of the National Agency of Protected Areas on the proposed development.

Hereinafter is the translated aswer of this Agency that agrees with the proposed interventions.

The original letter of answer follows the translated letter.

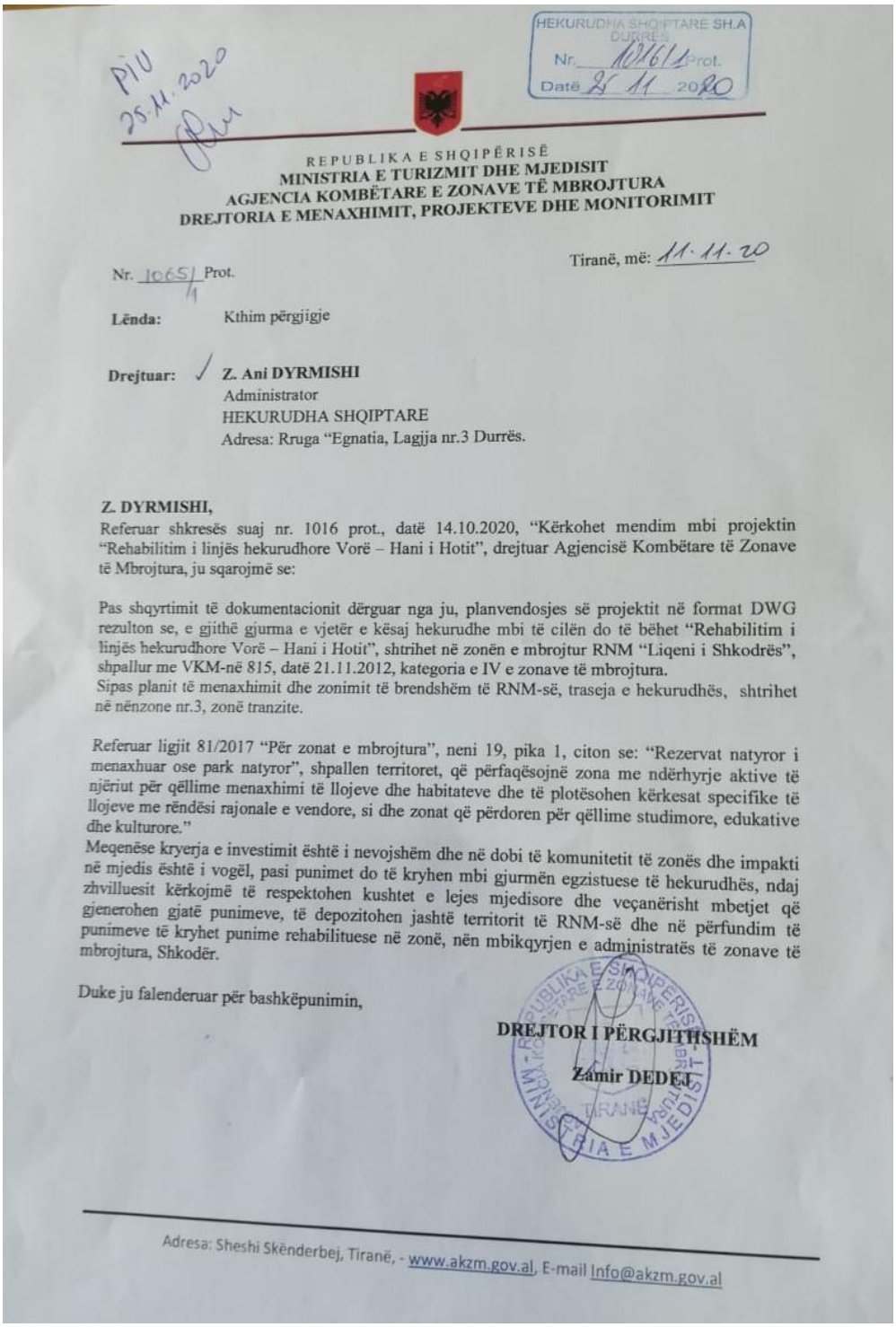
Opinion of the National Agency of Protected Areas (NAPA) on the proposed development (Letter of NAPA to Mr. Ani Durmishi, Administrator of the Albanian Railways
Republic of Albania Ministry of Tourism and Environment National Agency of Protected Areas Directorate for Management, Projects and Monitoring Prot. no. 1065/1 Tirana, on 11.11.2020 Subject: Response To: Mr. Ani Dyrmishi, Administrator of Albanian Railways Address: "Rruga Egnatia", Lagjia nr. 3 Durres Mr. Dyrmishi, Referring to your prot no. 1016, dated 14.10.2020, "Request for an opinion on the "Rehabilitation of the railway line Vore - Hani i Hotit" project, addressed to the National Agency of Protected Areas, we explain that: After reviewing the documentation sent by you, the project layout in dwg format it results that, all the existing route of this railway line on which will be done the "Rehabilitation of the railway line Vore - Hani i Hotit" project, lies in the protected area RNM "Shkoder Lake", as provided in DCM no. 815, dated 21.11.2012, category IV of protected areas. According to the management plan and internal zoning of the RNM, the railway route lies in subzone no. 3, transitional zone. As per Law 81/2017 "On protected areas", article 19, point 1, states that "Managed nature reserves or nature park", are declared territories, which represent areas with active human intervention for the purpose of managing the species and habitats and that the specific requirements for the species of regional and local importance are met, as well as that the areas are used for study, educational and cultural purposes". Given that this investment is necessary, of benefit to the local community and the impact on the environment is small, as the works will be carried out on the existing railway track, from the developer of this project we shall demand to respect the conditions of the environmental permit and especially the waste generated during the works, should be deposited outside the

territory of the RMN. At the end of the works rehabilitation works in the area, under the supervision of Regional Administration of Protected Areas in Shkoder, should be carried out.

Thanking for your cooperation,

General Director

Zamir Dedej



HEKURUDHA SHQIPTARE SH.A
DURRES
Nr. 1016/1 Prot.
Datë 25 11 2020

PIU
25.11.2020

REPUBLIKA E SHQIPËRISË
MINISTRIA E TURIZMIT DHE MJEDISIT
AGJENCIA KOMBËTARE E ZONAVE TË MBROJTURA
DREJTORIA E MENAXHIMIT, PROJEKTEVE DHE MONITORIMIT

Nr. 1065/1 Prot.

Tiranë, më: 11.11.20

Lënda: Kthim përgjigje

Drejtuar: **Z. Ani DYRMISHI**
Administrator
HEKURUDHA SHQIPTARE
Adresa: Rruga "Egnatia, Lagjja nr.3 Durrës.

Z. DYRMISHI,

Referuar shkresës suaj nr. 1016 prot., datë 14.10.2020, "Kërkohet mendim mbi projektin "Rehabilitim i linjës hekurudhore Vorë – Hani i Hotit", drejtuar Agjencisë Kombëtare të Zonave të Mbrojtura, ju sqarojmë se:

Pas shqyrtimit të dokumentacionit dërguar nga ju, planvendosjes së projektit në format DWG rezulton se, e gjithë gjurma e vjetër e kësaj hekurudhe mbi të cilën do të bëhet "Rehabilitim i linjës hekurudhore Vorë – Hani i Hotit", shtrihet në zonën e mbrojtur RNM "Liqeni i Shkodrës", shpallur me VKM-në 815, datë 21.11.2012, kategoria e IV e zonave të mbrojtura.
Sipas planit të menaxhimit dhe zonimit të brendshëm të RNM-së, traseja e hekurudhës, shtrihet në nënzone nr.3, zonë tranzite.

Referuar ligjit 81/2017 "Për zonat e mbrojtura", neni 19, pika 1, citon se: "Rezervat natyror i menaxhuar ose park natyror", shpallen territoret, që përfaqësojnë zona me ndërhyrje aktive të njëriut për qëllime menaxhimi të llojeve dhe habitateve dhe të plotësohen kërkesat specifike të llojeve me rëndësi rajonale e vendore, si dhe zonat që përdoren për qëllime studimore, edukative dhe kulturore."
Meqenëse kryerja e investimit është i nevojshëm dhe në dobi të komunitetit të zonës dhe impakti në mjedis është i vogël, pasi punimet do të kryhen mbi gjurmën egzistuese të hekurudhës, ndaj zhvilluesit kërkojmë të respektohen kushtet e lejes mjedisore dhe veçanërisht mbetjet që gjenerohen gjatë punimeve, të depozitohen jashtë territorit të RNM-së dhe në përfundim të punimeve të kryhet punime rehabilituese në zonë, nën mbikqyrjen e administratës të zonave të mbrojtura, Shkodër.

Duke ju falenderuar për bashkëpunimin,

DREJTOR I PËRGJITHSHËM
Zamir DEDEJ

REPUBLIKA E SHQIPËRISË ZONAVE TË MBROJTURA TIRANË MINISTRIA E MJEDISIT

Adresa: Sheshi Skënderbej, Tiranë, - www.akzm.gov.al, E-mail Info@akzm.gov.al

Figure 1.1_Opinion of the National Agency of Protected Areas on the proposed development

2 Appendices related to chapter 2

2.1 Appendix 2.1: Planned interventions – level crossings and service roads

2.1.1 Infrastructure in the section 1 (Vore-Gjorm): Km 20+620 to km 48+420

In total 14 level crossings are proposed for the railway line section Vore-Gjorm.

Table below shows the proposed level crossings and the category of the crossed roads.

Table 2.1_ Proposed secured level crossings and type of the crossed roads from Vore to Gjorm

No	LC	Section Detailed Design		Shoulder	Length (DD) m	Length (PD) m	Category (DCM 628/2015)	
		Lines	Width					
I	Vore-Budull							
1	LC 23+408	2x3.25	6.50m	1.00m	261.00m	116.00m	Local-In.urban	F2
2	LC 25+528	2x2.75	5.50m	0.50m	73.00m	83.00m	Urban	F2
3	LC 26+312	2x2.75	5.50m	0.50m	127.00m	129.00m	Urban	F2
4	LC 28+488	2x3.25	6.50m	1.00m	131.00m	141.00m	Local-In.urban	F2
	Budull - Ishem							
5	LC 30+304	2x3.25	6.50m	1.00m	122.00m	124.00m	Local-In.urban	F2
6	LC 33+124	2x3.25	6.50m	1.00m	163.00m	128.00m	Local-In.urban	F2
	Ishem - Mamurras							
7	LC 36+894	2x3.25	6.50m	1.00m		127.00m	Local-In.urban	F2
8	LC 39+995	2x3.25	6.50m	1.00m		149.00m	Local-In.urban	F2
9	LC 41+070	2x3.25	6.50m	1.00m		93.00m	Local-In.urban	F2
10	LC 42+249	2x3.00	6.00m	0.50m		99.00m	Local urban	E
11	LC 43+670	2x3.00	6.00m	0.50m		98.00m	Local urban	E
	Mamurras - Gjorm							
12	LC 45+760	2x3.25	6.50m	1.00m		135.00m	Local-In.urban	F2
13	LC 47+171	2x3.25	6.50m	1.00m		134.00m	Local-In.urban	F2
14	LC 48+356	2x3.25	6.50m	1.00m		119.00m	Local-In.urban	F2

In total 46 service roads are proposed for this railway line section, as shown in the table below. All the proposed service roads are of type 2 (non-paved), excepting the road from km 20+778 to km 22+247, which will be paved. The roads and their shoulders are 4.0 and 0.75m wide, repectively.

Table 2.2_Proposed new local and service roads from Vore to Gjorm

No.	Railway Chainage		Side of Railway (Left; Right)	Length (m)
	Start (km)	End (km)		
1	20+778	22+247	L	1,446
2	23+370	23+414	L	48
3	23+422	23+451	L	30
4	24+195	24+889	L	701
5	25+008	25+122	L	114
6	25+224	25+369	L	146
7	25+526	25+605	L	81
8	26+250	26+306	L	56
9	28+491	28+678	L	189
10	30+229	30+358	L	144
11	31+002	33+202	L	2,211
12	35+843	35+925	L	90
13	36+047	36+953	L	921
14	37+850	38+144	L	294
15	38+717	38+777	L	61
16	39+932	40+063	L	141
17	41+036	41+161	L	136
18	43+922	44+699	L	793
19	45+708	45+750	L	44
20	45+750	47+165	L	1418
21	47+165	48+089	L	955
22	48+578	49+111	L	529
23	25+449	25+527	R	80
24	26+243	26+309	R	67
25	27+784	28+390	R	637
26	28+324	28+676	R	380
27	33+073	33+342	R	277
28	33+258	33+414	R	184
29	34+522	34+914	R	395
30	35+923	36+911	R	1,004
31	38+361	39+992	R	1,630
32	41+077	41+123	R	49
33	42+182	42+307	R	133
34	42+457	42+959	R	508
35	42+939	43+104	R	179
36	43+660	43+724	R	67

No.	Railway Chainage		Side of Railway (Left; Right)	Length (m)
	Start (km)	End (km)		
37	43+984	44+196	R	252
38	44+838	45+089	R	285
39	45+076	45+175	R	104
40	25+449	25+527	R	80
41	26+243	26+309	R	67
42	27+784	28+390	R	637
43	45+106	45+769	R	665
44	45+769	46+954	R	1,209
45	46+940	47+171	R	271
46	47+572	48+346	R	774

2.1.2 Infrastructure in the section 2 (Gjorm - Lezhe): km 48+420 to km 68+780

In total 12 level crossings are proposed for the railway line section Gjorm - Lezhe. Table below shows the proposed level crossings and the crossed type of road.

Table 2.3_ Proposed secured level crossings and type of the crossed roads from Gjorm to Lezhe

No	Level Crossing	Section DD		Shoulder	Length (DD) m	Length (PD) m	Category (DCM 628/2015)	
		Lines	Width					
I	Gjorm - Lac							
1	LC 45+760	2x3.25	6.50m	1.00m		135.00m	Local-In.urban	F2
2	LC 47+171	2x3.25	6.50m	1.00m		134.00m	Local-In.urban	F2
3	LC 48+356	2x3.25	6.50m	1.00m		119.00m	Local-In.urban	F2
	Lac - Milot							
4	LC 50+504	2x3.50	7.00m	1.00m		472.00m	In.urbane/dyt esore	C3
5	LC 52+665	2x3.25	6.50m	1.00m		115.00m	Lokale-In.urbane	F2
6	LC 53+813	2x3.00	6.00m	0.50m		77.00m	Urbane/lagje	E
	Milot - Lezhe							
7	LC 57+233	2x3.25	6.50m	1.00m		125.00m	Local-In.urban	F2
8	LC 57+617	2x3.25	6.50m	1.00m		111.00m	Local-In.urban	F2
9	LC 58+507	2x3.25	6.50m	1.00m		96.00m	Local-In.urban	F2
10	LC 59+507	2x3.25	6.50m	1.00m		150.00m	Local-In.urban	F2
11	LC 62+054	2x3.00	6.00m	0.50m		90.00m	Urban	E

No	Level Crossing	Section DD		Shoulder	Length (DD) m	Length (PD) m	Category (DCM 628/2015)	
12	LC 67+187	2x3.50	7.00m	1.00m		53.00m	In.urban/secondary	C3

In total 26 local and service roads are proposed for this railway line section, as shown in the table below. All the proposed service roads are of type 2 (non-paved). The roads and their shoulders are 4.0 and 0.75m wide, repectively.

Table 2.4_Proposed new local and side roads from Gjorm to Lezhe

No.	Railway Chainage		Side of RW	Length
	Start km	End km		
1	48+578	49+111	L	529.22
2	49+700	50+264	L	566.34
2	50+501	50+735	L	238.65
4	51+374	51+614	L	240.53
5	51+757	51+961	L	210.34
6	52+661	53+831	L	1164.44
7	53+914	54+068	L	154.38
8	57+131	57+351	L	245.90
9	57+571	58+482	L	918.35
10	58+482	59+411	L	937.45
11	59+840	60+426	L	585.68
12	60+641	60+897	L	259.49
13	60+897	61+881	L	1011.57
14	61+870	62+047	L	176.74
15	67+438	67+630	L	200.49
16	67+887	68+195	L	328.67
17	48+533	49+348	R	838.00
18	49+711	50+371	R	813.79
19	49+870	49+891	R	22.15
20	50+348	50+878	R	545.41
21	52+656	54+094	R	1448.15
22	58+987	59+451	R	480.21
23	60+923	63+421	R	2523.66
24	65+063	65+415	R	365.38
25	67+457	67+655	R	203.27
26	68+589	68+683	R	175.66

2.1.3 Infrastructure in the section 3 (Lezhe - Shkoder)

In total 14 level crossings are proposed for the railway line section Lezhe - Shkoder.

Table below shows the proposed level crossings and the crossed type of road.

Table 2.5_ Proposed secured level crossings and type of the crossed roads from Lezhe to shkoder

No	Level Crossing	Section DD		Shoulder	Length (DD) m	Length (PD) m	Category (DCM 628/2015)	
		Lines	Width					
II	Lezhe - Baqel							
1	LC 72+154	2x2.75	5.50m	0.50m		140.00m	Urban	F2
2	LC 74+122	2x2.75	5.50m	0.50m		163.00m	Urban	F2
3	LC 76+873	2x2.75	5.50m	0.50m		142.00m	Urban	F2
4	LC 78+158	2x2.75	5.50m	0.50m		145.00m	Urban	F2
5	LC 79+778	2x2.75	5.50m	0.50m		197.00m	Urban	F2
6	LC 81+944	2x2.75	5.50m	0.50m		144.00m	Urban	F2
	Baqel - Mjede							
7	LC 84+427	-				135.00m		
8	LC 85+749	2x2.75	5.50m	0.50m		137.00m	Urban	F2
9	LC 88+879	2x2.75	5.50m	0.50m		137.00m	Urban	F2
10	LC 91+010	2x2.75	5.50m	0.50m		138.00m	Urban	F2
11	LC 91+877	2x2.75	5.50m	0.50m		183.00m	Urban	F2
	Mjede - Shkoder							
12	LC 94+370 (93+275)	2x3.50	7.00m	1.00m		142.00m	In.urban	C3
13	LC 97+959	2x2.75	5.50m	0.50m		139.00m	Urban	F2
14	LC 99+711	2x2.75	5.50m	0.50m		137.00m	Urban	F2

In total 56 local and service roads are proposed for this railway line section, as shown in the table below. All the proposed service roads are of type 2 (non-paved). The roads and their shoulders are 4.0 and 0.75m wide, repectively.

Table 2.6_Proposed new local and service roads from Lezhe to Shkoder

No.	Railway Chainage		Side of RW	Length
	Start km	End km		
1	69+809	70+033	L	**265.20**
2	70+523	71+096	L	**566.23**
2	71+720	74+083	L	**2377.83**
4	74+083	75+908	L	**1833.22**
5	76+404	76+843	L	**443.84**
6	76+843	77+479	L	**639.74**
7	78+124	80+139	L	**2028.25**

No.	Railway Chainage		Side of RW	Length
	Start km	End km		
8	80+914	81+047	L	**132.88**
9	81+469	81+666	L	**197.08**
10	81+909	83+082	L	**1181.78**
11	**82+989**	**83+082**	**L**	**92.85**
12	**84+257**	**84+401**	**L**	**149.36**
13	**84+401**	**84+466**	**L**	**70.91**
14	**84+529**	**84+611**	**L**	**81.47**
15	**84+708**	**84+917**	**L**	**208.28**
16	**85+042**	**85+724**	**L**	**686.22**
17	**85+724**	**85+826**	**L**	**109.54**
18	**86+411**	**86+575**	**L**	**164.85**
19	**87+357**	**87+664**	**L**	**307.00**
20	**88+206**	**88+857**	**L**	**659.05**
21	**88+859**	**89+165**	**L**	**312.78**
22	**90+218**	**90+456**	**L**	**240.21**
23	**90+923**	**90+986**	**L**	**66.51**
24	**91+225**	**91+570**	**L**	**354.58**
25	**92+495**	**92+963**	**L**	**587.95**
26	**95+381**	**95+705**	**L**	**327.86**
27	**96+279**	**96+346**	**L**	**67.57**
28	**96+765**	**96+879**	**L**	**119.31**
29	**97+507**	**97+938**	**L**	**435.79**
30	**97+938**	**99+688**	**L**	**1754.46**
31	**99+688**	**100+286**	**L**	**606.49**
33	100+683	100+737	L	60.67
33	103+912	107+427	L	3512.85
34	70+008	70+045	R	**40.66**
35	70+040	70+424	R	**403.52**
36	70+536	70+662	R	**125.87**
37	74+757	74+898	R	**145.55**
38	75+115	78+142	R	**3045.84**
39	79+765	80+058	R	**300.95**
40	81+471	82+111	R	**655.61**
41	82+076	82+979	R	**928.02**
42	82+070	82+079	R	**58.25**
43	84+135	84+405	R	**289.64**
44	85+726	86+592	R	**876.36**

No.	Railway Chainage		Side of RW	Length
	Start km	End km		
45	84+405	85+726	R	**1333.52**
46	87+005	88+075	R	**1087.56**
47	88+854	89+351	R	**501.57**
48	90+258	90+985	R	**748.12**
49	90+985	91+682	R	**706.86**
50	91+822	91+874	R	**54.74**
51	95+580	95+671	R	**107.72**
52	96+569	96+790	R	**229.50**
52	97+636	97+943	R	**315.74**
54	97+902	97+920	R	**20.79**
55	97+943	99+687	R	**1757.14**
56	99+687	99+957	R	**274.57**

2.1.4 Infrastructure in the section 4 (Shkoder – Hani Hotit)

In total 17 level crossings are proposed for the railway line section Shkoder – Hani Hotit.

Table below shows the proposed level crossings and the crossed type of road.

Table 2.7_ Proposed secured level crossings and type of the crossed roads from Shkoder to Hani Hotit

No	LC	Section DD		Shoulder	Length (DD) m	Length (PD) m	Category (DCM 628/2015)	
		Lines	Width					
II	**Shkoder - Koplik**							
1	LC 106+560	2x3.00	9	LC 106+560	2x3.00	9	LC 106+560	2x3.00
2	LC 108+183	2x3.00	10	LC 108+183	2x3.00	10	LC 108+183	2x3.00
3	LC 109+447	2x2.75	11	LC 109+447	2x2.75	11	LC 109+447	2x2.75
4	LC 111+358	2x2.75	12	LC 111+358	2x2.75	12	LC 111+358	2x2.75
6	LC 113+342	2x2.75	5.50m	0.50m		103.00m	Urban	F2
5	LC 114+586	2x2.75	5.50m	0.50m		102.00m	Urban	F2
6	LC 118+459	2x2.75	5.50m	0.50m		153.00m	Urban	F2
7	LC 119+660	2x2.75	5.50m	0.50m		111.00m	Urban	F2
8	LC 120+583	2x3.25	6.50m	1.00m		142.00m	Local-In.urban	F2
9	LC 122+585	2x2.75	5.50m	0.50m		136.00m	Urban	F2
	Koplik – Bajze							
10	LC 123+465	2x3.25	6.50m	1.00m		152.00m	Local-In.urban	F2
11	LC 128+176	2x2.75	5.50m	0.50m		143.00m	Urban	F2

No	LC	Section DD		Shoulder	Length (DD) m	Length (PD) m	Category (DCM 628/2015)	
12	LC 130+542	2x2.75	5.50m	0.50m		130.00m	Urban	F2
	Bajze – Hani Hotit							
13	LC 132+297	2x3.25	6.50m	1.00m		139.00m	Local-In.urban	F2
14	LC 133+388	2x2.75	5.50m	0.50m		164.00m	Urban	F2
15	LC 135+236	2x2.75	5.50m	0.50m		111.00m	Urban	F2
16	LC 136+191	2x2.75	5.50m	0.50m		128.00m	Urban	F2
17	LC 138+051	2x2.75	5.50m	0.50m		138.00m	Urban	F2

In total 41 local and service roads are proposed for this railway line section, as shown in the table below. All the proposed service roads are of type 2 (non-paved). The roads and their shoulders are 4.0 and 0.75m wide, repectively.

Table 2.8_Proposed new local and service roads from Shkoder to Hani Hotit

No.	Railway Chainage		Side of RW	Length
	Start km	End km		
1	103+912	107+427	L	3512.85
2	107+756	107+901	L	144.73
3	108+070	108+175	L	115.26
4	108+269	108+917	L	683.23
5	109+174	110+520	L	1357.50
6	110+520	111+170	L	651.90
7	111+288	111+340	L	61.00
8	112+621	112+802	L	186.52
9	113+780	113+904	L	125.95
10	114+040	117+966	L	3938.68
11	118+088	120+557	L	2493.18
12	121+340	122+821	L	1500.35
13	122+821	124+304	L	1535.23
14	124+518	124+838	L	323.84
15	124+996	125+172	L	183.15
16	125+168	126+592	L	1464.46
17	127+418	131+104	L	3715.43
18	132+272	131+902	L	370.14
19	132+275	133+387	L	1119.93
20	134+601	135+654	L	1063.46
21	108+125	109+405	R	1294.55
22	109+405	109+498	R	98.56

No.	Railway Chainage		Side of RW	Length
	Start km	End km		
23	109+587	110+494	R	913.13
24	100+602	100+684	R	87.55
25	100+684	100+790	R	110.73
26	103+926	108+125	R	4214.08
27	110+494	111+490	R	1002.25
28	112+603	113+094	R	495.36
29	111+642	112+603	R	1038.75
30	113+029	113+698	R	668.33
31	119+522	120+202	R	703.05
33	121+357	121+949	R	610.37
33	122+133	122+822	R	700.11
34	122+820	123+121	R	323.62
35	123+175	124+996	R	1838.40
36	124+996	126+314	R	1342.95
37	126+284	126+856	R	582.86
37	128+148	131+173	R	3047.86
39	132+273	133+331	R	1087.81
40	134+603	135+248	R	658.82
41	137+764	138+542	R	836.75

2.2 Appendix 2.2: Planned interventions –small bridges

Roughly 74 minor bridges are planned within the whole railway line. Most of them will replace the exiting ones, which will be demolished. The design has added some new small bridges in new locations, as shown in the table below.

Table 2.9_List of small bridges and the proposed intervention for each of them

No.	Kmp	Existing bridges		Proposed span	Proposed new bridges	Stream name	Action and comment
		Type	Span (No x L) m	Span (No x L) m	Span (No x L) m		
1	20+974.00	RC Slab	3X4		1X10	Gryka e Dodajve	Existing R/C slab bridge with span (3x4)m to be replaiced with new R/C slab bridge with span (1X10) m
2	22+239.00	RC Slab	1x14	1x15		Shargës	km 22+239.00: Ecisting Road bridge with span (1x14)m
3	23+159.00	RC Slab	3x4		1x10	Ajshes (new Preza reservoir)	km 23+159.00: Ecisting R/C slab bridge with span (1x14)m to be replaiced with new R/C slab bridge with span (1X10) m
4	25+396.00	RC Slab	3x4		1x10	Marie(Fushë prezë)	km 25+396.00: Ecisting R/C slab bridge with span (3x4)m to be replaced with new R/C slab bridge with span (1X10) m
5	26+094.00	RC Slab	3x4		1x10	Kames (Fushë prezë)	km 26+094.00: Ecisting R/C slab bridge with span (3x4)m to be replaced with new R/C slab bridge with span (1X10) m
6	26+885.60	RC Slab	3x4		1x10	Zalljet (Ahmetaq)	km 26+885.00: Ecisting R/C slab bridge with span (3x4)m to be replaced with new R/C slab bridge with span (1X10) m
7	27+538.00	RC Slab	2x4		1x10	Ahmetaq	km 27+538.00: Ecisting R/C slab bridge with span (2x4)m to be replaced with new R/C slab bridge with span (1X10) m
8	28+241.00				1x10		km 28+241.00: Existing pipe culvert ϕ 1500 mm
9	29+237.00	RC Slab	1x10	1X10		Llabiaxha (Budull)	km 29+237.00: Ecisting R/C slab bridge with span (1x10)m to be replaced with new R/C slab bridge with span (1X10) m
10	30+198.00	RC Slab	3x4		1X10	Rosalje (Budull)	km 30+198.00: Ecisting R/C slab bridge with span (3x4)m to be replaced with new R/C slab bridge with span (1X10) m
11	38+341.00	RC Slab	3x10	3x10		Thumana	km 38+341: Existing R/C slab bridge with span (3x10)m
12	38+743.00				1x10	Thumana draiange channel	km 38+743.00: Existing pipe culvert (3 ϕ 1200) mm to be replaced with new R/C slab bridge with span (1x10) m
13	41+053.00	RC Slab	1x10	1x10		Shpërdhet	km 41+053.00: Existing R/C slab bridge with span (1x10)m
14	42+997.00	RC Slab	3x4		1x10	Mamurras	km 42+997.00: Existing R/C slab bridge with span (3x4)m to be replaced with new R/C slab bridge with span (1x10)m
15	43+462.00	RC Slab	2x10	2x10		Shperdheti	km 43+462.00: Existing R/C slab bridge with span (2x10)m

No.	Kmp	Existing bridges		Proposed span	Proposed new bridges	Stream name	Action and comment
16	44+792.00	RC Slab	4x10	4x10		Channel, Mamurras	km 44+792.00: Existing R/C slab bridge with span (4x10)m
17	50+480.00	RC Slab	1x6	1x5		Lac	km 50+480.00: Existing R/C slab bridge with span (1x6)m
18	51+733.00	RC Slab	1x6	1x5		Shullaz	km 51+733.00: Existing R/C slab bridge with span (1x6)m
19	51+835.00	RC Slab	1x6	1x5		Shullaz	km 51+835.00: Existing R/C slab bridge with span (1x6)m
20	54+188.00	RC Slab	4x10	4x10		Fushë Milot	km 54+188.00: Existing R/C slab bridge with span (4x10)m
21	54+532.00	RC Slab	1x7.7	1x8		Fushë Milot	km 54+532.00: Existing R/C slab bridge with span (1x7.7)m
22	55+506.00	OVERPASS					km 55+506.00: Existing OVERPASS
23	56+615.00	RC Slab	1x10	1x10		Mati river	km 56+615.80: Existing R/C bridge with span (1x10)m
24	57+206.00	RC Slab	3x8	3x8		Pllanës	km 57+206.00: Existing R/C slab bridge with span (3x8)m
25	57+290.00	RC Slab	3x4		1x10		km 57+290.00: Existing R/C slab bridge with span (3x4)m
26	57+591.00	RC Slab	1x5	1x5		Pllana	km 57+591.00: Existing R/C slab bridge with span (1x5)m
27	59+485.00	RC Slab	1x14		1x10	Pllekani channel	km 59+485.00: Existing R/C slab bridge with span (1x14)m to be replaced with new R/C slab bridge with span (1x10)m
28	62+478.00				1x10	Spiteni	km 62+478.00: Existing pipe culvert 3xϕ2000 mm to be replaced with new bridge with span (1x10) m
29	63+085.00	RC Slab	1x4		1x5	Tresh	km 63+085.00: Existing R/C slab bridge with span (1x4)m
30	63+632.00	OVERPASS					km 63+632.00: Existing OVERPASS
31	63+860.00	RC Slab	2x5	2x5		Tresh	km 63+860.00: Existing bridge 2x5 m
32	64+094.00	RC Slab	2x4.5	2x5		Tresh	km 64+094.00: Existing bridge 2x4.5 m
33	64+345.00	RC Slab	1x5	1x5		Tresh	km 64+345.00: Existing R/C slab bridge with span (1x5)m
34	64+592.00	RC Slab	1x5	1x5		Tresh	km 64+592.00: Existing bridge 1x5 m
35	64+841.00	RC Slab	1x5	1x5		Tresh	km 64+841.00: Existing R/C slab bridge with span (1x5)m
36	65+091.00	RC Slab	1x5	1x5		Manati	km 65+091.00: Existing bridge (1x5)m
37	65+231.00	RC Slab	1x5	1x5		Manati	km 65+231.00: Existing bridge (1x5)m
38	65+852.00	RC Slab	1x5	1x5		Manati drainage channel	km 65+852.00: Existing R/C slab bridge with span (1x5)m

No.	Kmp	Existing bridges		Proposed span	Proposed new bridges	Stream name	Action and comment
39	65+901.00	RC Slab	1x5		1x5	Ishull Lezhe	km 65+901.00: Existing R/C slab bridge with span (1x5)m
40	66+608.00	RC Slab	1x5	1x5		Ishull Lezhe	km 66+608.00: Existing R/C slab bridge with span (1x5)m
41	66+790.00	RC Slab	1x5	1x5		Ishull Lezhe (drainage channel)	km 66+790.00: Existing R/C slab bridge with span (1x5)m
42	67+199.00	RC Slab	1x5	1x5		Ishull shëngjin	km 67+202.90: Existing R/C slab bridge with span (1x5)m
43	67+468.00	RC Slab	3x7.5	3x8		Ishul shëngjin	km 67+468.00: Existing R/C slab bridge with span (3x7.5)m
44	68+437.00	OVERPASS					km 68+437.00: Existing OVERPASS
45	68.800-69+050	Tunnel					km 68.800-69+050: Existing OVERPASS
46	69+186.00	OVERPASS				Lezha	km 69+186.00: Existing OVERPASS
47	69+524.00	RC Slab	1x5	1x5		Lezha	km 69+524.00: Existing R/C slab bridge with span (1x5)m
48	85+807.00	RC Slab	1x4.5	1x5		Nënshat	km 85+807.00: Existing R/C slab bridge with span (1x4.5)m
49	86+776.00	RC Slab	1x8.5	1x8		Hajmel	km 86+776.00: Existing R/C slab bridge with span (1x8.5)m
50	87+100.00	RC Slab	1x4.5	1x5		Hajmel	km 87+100.00: Existing R/C slab bridge with span (1x4.5)m
51	87+257.00	RC Slab	1x5	1x5		-	km 87+257.00: Existing R/C slab bridge with span (-)m
52	87+691.00	RC Slab	1x4.5	1x5		Hajmel	km 87+691.00: Existing R/C slab bridge with span (1x4.5)m
53	88+025.00	RC Slab	1x4.5	1x5		Source of Lajthiza	km 88+025.00: Existing R/C slab bridge with span (1x4.5)m
54	88+671.00	RC Slab	2x4.7	2x5		Hajmeli	km 88+671.00: Existing R/C slab bridge with span (2x4.7)m
55	89+775.00	RC Slab	1x4.5	1x5		Plepeshte	km 89+775.00: Existing R/C slab bridge with span (1x4.5)m to be replaced with new R/C slab bridge with span (1x10)m
56	90+225.00	RC Slab	3x4.0		1x10	Gjadri branch river	km 90+225.00: Existing R/C slab bridge with span (3x4.0)m
57	91+885.00	RC Slab	1x8.0	1x8		Naraç	km 91+885.00: Existing R/C slab bridge with span (1x8)m
58	92+252.00	RC Slab	1x8.0	1x8		Shelqet	km 92+252.00: Existing R/C slab bridge with span (1x8.0)m
59	93+308.00				1x10		km 93+308.00: Existing pipe culvert5x ϕ1900 mm
60	95+782.00	RC Slab	1x4.5	1x5		Ganjolle	km 95+782.00: Existing R/C slab bridge with span (1x4)m
61	102+147.00	RC Slab	2x10	2x10		Drini channel	km 102+147.00: Existing R/C slab bridge with span (2x10)m

No.	Kmp	Existing bridges		Proposed span	Proposed new bridges	Stream name	Action and comment
62	102+563.00	RC Slab	1x4.5	1x5		near Kiri river	km 102+563.00: Existing R/C slab bridge with span (1x4.5)m
63	103+323.00	RC Slab	1x9	1x10		near Kiri river	km 103+323.00: Existing R/C slab bridge with span (1x9)m
64	106+826.00					Shkodër	km 106+826.00: Existing R/C slab bridge with span (1x2.5)m
65	107+377.00	OVERPASS					km 107+377.00: OVERPASS
66	113+758.00	OVERPASS	1x55				km 113+770.00: Overpass with span (1x55)m
67	116+477.00	RC Slab	1x4.5	1x5		Lugjeve channel	km 116+477.00: Existing R/C slab bridge with span (1x4.5)m
68	118+921.00	RC Slab	1x5	1x5		Ziçës channel (Demiraj)	km 118+921.00: Existing R/C slab bridge with span (1x5)m
69	122+017.00	RC Slab	1x5	1x5		Bogiq)	km 122+017.00: Existing R/C slab bridge with span (1x5)m
70	125+013.00	UNDERPASS					km 125+013.00: Underpass
71	135+706.00	OVERPASS					km 135+706.00: Existing OVERPASS
72	136+030.00	RC Slab	1x4.5		2x10	Vukpalaj	km 136+030.00: Existing R/C slab bridge with span (1x4.5)m
73	136+738.00	RC Slab	1x4.5		2x10	Vukpalaj Bajza	km 136+738.00: Existing R/C slab bridge with span (1x4.5)m
74	138+551.00	RC Slab	1x8	1x8			km 138+551.00: Existing R/C slab bridge with span (1x8)m

2.3 Appendix 2.3: Planned interventions – retaining walls

Table below shows the location and length of the planned retaining walls. The retaining walls include also the protection works against rivers and streams erosion. The longer protection works are planned in the Kiri Riverbed.

Table 2.10_Location and length of the planned retaining walls

No	Section	From (km)	To (km)	Left/Right	Length (m)
1	1	22+701	22+728	R	26.24
2	1	23+232	23+283	R	51.02
3	1	43+721	43+897	R	201.27
4	1	22+430	22+487	R	56.98
5	1	40+295	40+312	R	16.96
6	1	23+275	23+403	L	126.13
7	1	23+419	23+443	L	23.90
8	1	36+916	37+217	L	301.36
9	1	41+747	41+791	L	46.84
10	2	56+608	57+167	R	557.33
11	2	69+026	69+138	R	111.66
12	2	69+511	69+613	R	101.64
13	2	56+470	56+581	R	110.81
14	2	55+570	55+681	R	114.40
15	2	63+627	63+716	R	88.85
16	2	57+623	57+683	R	60.00
17	2	81+809	81+906	R	97.74
18	2	49+704	50+264	L	560.66
19	2	69+026	69+144	L	118.16
20	2	69+511	69+609	L	97.84
21	2	57+237	57+263	L	25.78
22	2	74+578	74+695	L	116.18
23	2	81+575	81+647	L	72.00
24	2	45+872	46+198	L	325.81
25	2	51+614	51+706	L	92.18
26	2	73+326	73+351	L	25.00
27	3	107+368	107+539	R	171.75
28	3	104+526	105+541	R	1014.23
29	3	94+069	94+340	R	271.95
30	3	94+352	94+385	R	32.57
31	3	103+512	103+443	R	69.91
32	3	102+570	102+882	R	312.10

No	Section	From (km)	To (km)	Left/Right	Length (m)
33	3	94+493	94+796	R	303.45
34	3	95+043	95+537	R	496.70
35	3	105+555	106+538	R	983.33
36	3	106+551	107+357	R	808.27
37	3	103+927	104+512	R	584.95
38	3	91+034	91+189	R	155.55
39	3	87+840	880-1	R	158.47
40	3	91+081	91+127	L	46.57
41	3	105+555	106+537	L	981.57
42	3	106+553	107+352	L	797.04
43	3	103+967	104+512	L	546.18
44	3	104+527	105+540	L	1013.70
45	3	103+504	103+467	L	41.51
46	3	109+107	109+176	L	73.34
47	3	85+398	85+420	L	22.50
48	4	119+297	119+346	R	48.73
49	4	117+045	117+193	R	150.61
50	4	118+821	118+896	R	74.83
51	4	118+459	118+493	R	35.94
52	4	123+432	123+383	R	49.92
53	4	130+382	130+553	R	170.95
54	4	122+119	122+136	R	18.50
55	4	113+226	113+489	L	263.64
56	4	117+563	117+646	L	83.64
57	4	120+277	120+382	L	105.18
58	4	120+488	120+538	L	49.51

3 Appendices related to chapter 3

3.1 Appendix 3.1: Gap analysis on land acquisition issues

Table 3.1_Gap analysis on Land acquisition issues

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
Involuntary resettlement	Albanian Legislation in general including the Expropriation Law of the Republic of Albania, does not recognize the term involuntary resettlement. Issues related to land acquisition in the public interest are regulated by Law No. 8561 on Expropriation.	EBRD Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and economic displacement (loss of assets or resources, and/or loss of access to assets or resources that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition1 and/or restrictions on land use.	Gaps regarding physical and economic displacement, as well as displacement of those who do not have formal legal rights to the land and structures which they occupy are discussed further in the table. GAP/COMMENT: The law focuses on properties and assets which may be expropriated or temporarily occupied, in the public interest. The law recognizes affected people who have formal legal right.
Land acquisition / restriction of access	The law regulates the right of the state to expropriate properties of natural or juridical persons in the public interest, (Article 1), against fair compensation (Article 2). In addition, compensation is to be provided for the devaluation of properties which are not the object of expropriation (Article 4). The law regulates temporary occupation of land in Articles 27 and 28 (e.g. for construction works, setting up construction sites, etc.), for up to 2 years (Article 33), against set compensation (Article 30).	Involuntary resettlement occurs as a result of: 1. Land acquisition which includes both outright purchases of property and purchases of access rights (i.e. rights of way) 2. Imposition of restrictions that result in people experiencing loss of access to physical assets or natural resources.	Solutions for overcoming restrictions that result in loss of access to physical assets or natural resources, have to be considered and defined, on a case by case basis, for a particular project. GAP/COMMENT: Restrictions that result in people experiencing loss of access to physical assets or natural resources are not covered by Albanian legislation.
Scope of impact (Project design)	There are no legal requirements in Albanian legislation for avoiding or at least minimizing physical and / or economic displacement. However, in practice, resettlement and expropriation are avoided or minimized during project design, in the context of minimizing costs	Consideration of feasible alternative project designs to avoid or at least minimize physical and/or economic displacement, while balancing environmental, social, and economic costs and benefits.	Ensure that minimization of physical and /or economic displacement is investigated during project design and maximized to the extent practically possible. Whenever possible, integrate the consideration of resettlement issues in the EIA process. **GAP/COMMENT**: There are no legal requirements in Albanian legislation for avoiding or at least minimizing physical and / or economic displacement. However, in practice, resettlement and expropriation are avoided or minimized during project design, in the context of minimizing costs.

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
Planning Process	According to the expropriation law, the application for expropriation in the public interest, submitted by the expropriation beneficiary to the competent ministry, has to include a detailed list of properties to be expropriated and which are affected by devaluation, their location, information about individuals who have formal legal rights on these properties, including owners and third persons (Article 10). Ownership or other formal legal rights on land and structures are recorded in the Immovable Property Registration Office (Law on Registration of Immovable property -7843), through the Albanian Immovable Property Registration System. All issues regarding property rights have to be resolved before the expropriation payment is made; in case of disputes, the affected parties turn to the court to decide who will receive compensation, which has been deposited into a special account (Article 16). Those with formal legal rights are informed about the expropriation process through direct notification and publication of the application of expropriation (Articles 14 and 15). Third persons can submit their claims on affected properties, within a period of 15 days from the last day of the publication (Article 15).	A socio-economic baseline assessment shall be carried out on the people affected by the project, including impacts related to land acquisition and restrictions on land use. The assessment will identify impacts within a project's social context and the needs and rights of the affected people and develop appropriate actions to minimize and mitigate resettlement impacts. A detailed census is carried out to: (i) identify persons who will be displaced by the project; (ii) determine who will be eligible for compensation and assistance; and (iii) take inventory of affected land and property. The census should take into account the needs of seasonal resource users who may not be present in the project area during the time of the census. Additional requirements apply to consultations which involve Indigenous Peoples as well as individuals belonging to vulnerable groups necessary actions to ensure that vulnerable groups are not disadvantaged in the resettlement process, are fully informed and aware of their rights, and are able to benefit equally from the resettlement opportunities and benefits. These groups should be identified through the process of environmental and social assessment (as outlined in PR 1).	The implementation of a census/ survey and development of a RAP/LRF for each project which requires land acquisition (physical or economic displacement) is necessary. This process needs to ensure all categories of affected people (not only those with formal legal rights) are informed and consulted in a meaningful way. If vulnerable groups are identified during the survey, it may be necessary to make special provisions to include them in the consultation process. **GAP/COMMENT:** Albanian legislation does not require the development of specific resettlement / livelihood restoration plans, nor the implementation of a census / socio-economic survey. All affected persons are informed about the upcoming expropriation through the publication of the application for expropriation. However, there are no requirements for consultations with any affected persons or making special provisions for informing / consulting vulnerable groups. All persons who do not have formal legal rights on land and structures located in the project area are not eligible for compensation or resettlement assistance according to the Expropriation law and therefore there is no cutoff date for eligibility.
Cut-off date	Persons who have formal legal rights on land and structures, as registered by the Immovable Property Registration System, are entitled to compensation13. Preliminary valuations (inventory) of properties / assets, take place before the application for expropriation is submitted to the relevant Ministry (Article 10). Final valuations are performed by the Ministry	In the absence of specific national government procedures, the cut-off date for eligibility as foreseen in the applicable legislation and project timeline as appropriate shall be established. Often the most practicable cut-off date is during the baseline assessment or census. Information regarding the cut-off date will be well documented and communicated throughout the project area. Setting a cut-off date will	The date when the census is carried out should be agreed with the implementing agency and specified in the RAP/LRF as the cutoff date for eligibility for compensation and resettlement for all persons who do not have formal legal rights on land and structures located in the project area. Affected people must be informed about the cut-off date.

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
	commission (Article 17) and submitted with the proposal for expropriation to the Council of Ministers.	provide clarity as to eligibility for compensation and assistance. Persons moving into the project location after the cut-off date are not entitled to compensation or other assistance.	
Negotiated settlements	Negotiated settlements are encouraged by the Expropriation Law. Article 6, states that when the owner agrees to transfer his/her property to the state, under conditions (compensation) offered by the competent ministry, expropriation is considered completed. The owner has to inform the competent ministry within 15 days from being notified (publication) whether he/she accepts the offer (Article 16). If an agreement is not reached, after a decision on expropriation is passed by the Council of Ministers, the affected owner has the right to appeal to the court regarding the amount of compensation (Article 24).	Negotiated settlements help avoid expropriation and eliminate the need to use governmental authority to remove people forcibly. Negotiated settlements can usually be achieved by providing fair and appropriate compensation and other incentives or benefits to affected persons or communities, and by mitigating the risks of asymmetry of information and bargaining power.	Negotiated settlements, even before the expropriation process is initiated (before the application for expropriation is made public), should be explicitly encouraged in the RAP/LRF.
Compensation at replacement cost	The Expropriation law states that compensation is to be provided based on a final valuation of affected properties by the Ministry Commission for Expropriation, as defined by the Decision of the Council of Ministers (Article 17 and 18). This article explicitly states that depreciation of structures and assets is to be taken into account. Temporary occupation of property is also possible according to the Expropriation law, against a set compensation (Article 30). Compensation rates are provided by the Property Restitution and Compensation Agency of the Republic of Albania, based on recent market transactions in neighboring areas.	All displaced persons and communities will be offered compensation for loss of assets at full replacement cost and other assistance. This is intended to restore, and potentially improve, their standards of living and/or livelihoods of displaced persons to pre-displacement levels. The measures can be based on land, resources, wages and/or business activities. Standards for compensation will be transparent and consistent within the project. Compensation will be provided before displacement or imposition of access restrictions. Where livelihoods of displaced persons are land-based, or where land is collectively owned, land-based compensation, shall be offered, when feasible, taking into account seasonal and agricultural timing requirements. Opportunities shall be provided	THE RAP/LRF must describe the valuation method in detail and specify that compensation will include the registration cost in the Immovable Property Registration System, or other relevant register, any administrative fees, and/or transfer taxes. Depreciation of structures and assets should not be taken into account during valuations. **GAP/COMMENT:** The law does not specifically mention compensation for the costs of any registration and transfer taxes. Although the EBRD standards includes the option of the physical compensation, the application of the Albanian Law standard is mandatory. The land surface required for the proposed new freight station of Lezha shall be compensated in cash (at the free market price.

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
		to displaced persons and communities to derive appropriate development benefits from the project.	
Compensation in kind/cash	In the case of physically displaced persons they will be offered choice of options for adequate housing with security of tenure so that they can resettle legally without having to face the risk of forced eviction. Compensation in kind will be offered in lieu of cash compensation where feasible. This applies to those who have customary and traditional rights recognized under the laws of the country; to claimants who, prior to the cut-off date, do not have formal legal rights to land, but who have a claim to such land or assets, for example, through adverse possession; and to those who have no recognizable legal right or claim to the land they occupy.	The Expropriation law does not specify whether compensation is provided in cash or in kind. Certain provisions of the law imply that compensation is provided in cash.	Affected people should be able to receive in kind compensation whenever it is feasible and when this form of compensation is their preferred choice. **GAP/COMMENT:** The Expropriation law does not specify whether compensation is provided in cash or in kind. Certain provisions of the law imply that compensation is provided in cash.
Provision of adequate housing/shelter with security of tenure	Decree no. 814/2004, adopted based on the Law on Social Programs for the Housing of Inhabitants of Urban Zones, establishes housing norms/standards and the minimum living area per person.	Adequate housing or shelter can be measured by quality, safety, affordability, habitability, cultural appropriateness, accessibility and locational characteristics. Adequate housing should allow access to employment options, markets, and basic infrastructure and services, such as water, electricity, sanitation, health care and education. New resettlement sites built for displaced persons will offer, at a minimum, pre-displacement living conditions and where achievable, sustainable and cost-effective opportunities to improve the standard of living. Security of tenure exists if resettled persons are protected from forced evictions, to the greatest extent possible.	During the development of the RAP, when compensation is provided in the form of replacement housing, affected people should be consulted in defining standards for adequate housing. Those that do not have formal legal rights to properties have to be resettled to appropriate accommodation and have to have security of tenure, i.e. through signed contracts. Such contracts must include all members of the affected household, to ensure that they are all protected from forced evictions. **GAP/COMMENT:** The Expropriation Law does not foresee compensation in kind and therefore the provision of adequate housing with security of tenure. The expropriation law does not include any provisions about resettlement sites.

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
Other resettlement assistance	According to Law no. 9355 on social assistance and services vulnerable citizens of Albania are entitled to various forms of social welfare payments or a range of community-based services (public and private).	Other resettlement assistance, such as skills training, access to credit and job opportunities should be made equally available to men and women and adapted to their needs. Relocation assistance suited to the needs of each group of displaced persons, with particular attention paid to the needs of the poor and the vulnerable shall be offered.	Arrange for relocation costs to be compensated in cash or organize transport for people and all of their belongings / assets (specify in the RAP). Vulnerable groups should receive assistance in accordance with their specific needs. This should be done in cooperation with social service departments (municipal or state). At a minimum, vulnerable groups should have access to documentation, education, health and social services. Specific assistance has to be defined on a case by case basis for a particular project. **GAP/COMMENT:** Provision of relocations costs and specific resettlement assistance for vulnerable groups are not foreseen by the Expropriation law.
Eligibility for compensation /resettlement and entitlements in case of physical displacement	The Expropriation law foresees compensation to be paid to those who have formal legal rights (Category 1) for land, buildings of every kind of a permanent nature (Article 8), against fair compensation (Article 2). The Law No. 9232 on Social Programs for the Housing of Inhabitants of Urban Zones establishes the legal framework for development of social housing programs in Albanian municipalities. The law defines the administrative regulations and procedures that will ensure the planning, management and distribution of social housing to vulnerable people, in line with their income and the level of state support.	Persons: (i) who have formal legal rights to the land (including customary and traditional rights recognized under national laws); (ii) who do not have formal legal rights to land at the time of the census, but who have a claim to land that is recognized or recognizable under national laws shall receive: Compensation for land at full replacement cost In the case of physical displacement, replacement property of equal or higher value with equivalent or better characteristics and advantages of location or cash compensation at full replacement value and relocation assistance. (iii) who have no recognizable legal right or claim to the land they occupy should receive: Compensation for lost assets (such as crops, irrigation infrastructure and other improvements made to the land)other than land, at full replacement cost.	Provide assistance to persons in Category 2 to acquire a formal legal status before expropriation (over land and structures), in which case they move into Category 1 and are entitled to compensation as per the Expropriation law. The applicable law is: Law no.9482 on legalization, urban planning and integration of unauthorized buildings (legalization of structures erected on untitled land, except when the land in question is for public purposes) In the case of legalization of structures, the previous registered owners are entitled to compensation for land as per Law No. 9235 on Property return and compensation. In case of physical displacement, at a minimum, provide some form of social (low rent) housing for Category 3. Calculate the construction value of their structures and reduce their rent to correspond to the value of the structure they owned or pay cash compensation. This category is typically the most vulnerable, therefore resettlement assistance must be provided (see below). **GAP/COMMENT:** Those who have a claim to land that is recognized or recognizable under the national laws (Category 2) and those who have no recognizable legal right or claim to the land (Category 3) are not recognized by the Expropriation law. The provisions of the Law NO.9232 On Social Programs for the Housing of Inhabitants of Urban Zones should be used as a basis

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
		In case of physical displacement, a choice of options for adequate housing with security of tenure so that they can resettle legally without having to face the risk of forced eviction and other resettlement assistance.	for ensuring that those who are adversely affected by resettlement (usually belonging to Category 3) receive appropriate accommodation. However, it should be noted that the need for social apartments among the general population is great, while resources for constructing new apartments are scarce. EBRD standards to be applied; The Consultant (with the assistance of the affected municipalities) will scrutinize all kind of potential physical and/or economic displacement; Anyway, the only physical and/or economic displacement might occur with regard to the land surface required for the proposed new freight station of Lezha; The Consultant will pay special attention to the PAP that may be affected from the land use restriction from limitation of the unauthorized crossings. Secondary roads, underpasses and overpasses will be built to avoid/minimizing economic displacement. The Consultant will pay special attention to the PAP that may be affected from the land surface required for the construction of the proposed secondary roads, underpasses, overpasses and the proposed new freight station in Lezha.
Vulnerable groups	Article 5 of the Law on Social Programs for the Housing of Inhabitants of Urban Zones specifies categories of vulnerable groups that are entitled to social housing, i.e. those who have not benefitted from buying state owned apartments (privatization); where heads of household are divorced woman or widows; single parent families; retired elderly people who do not receive state assistance; various groups of disabled individuals; families with many children; young couples whose combined age is no	The necessary actions will be taken to account to ensure that vulnerable groups are not disadvantaged in the resettlement process, are fully informed and aware of their rights, and are able to benefit equally from the resettlement opportunities and benefits. These groups should be identified through the process of environmental and social assessment. Vulnerable groups refer to people who, by virtue of gender identity, ethnicity, age, disability, economic disadvantage or social status may be more adversely affected by project impacts than others and who may	During the census it is necessary to identify vulnerable groups and assess their needs related to resettlement and relocation assistance, including access to specific services. Consultations can be held in the form of focus groups to consult with and address the needs of specific groups. Social welfare and other appropriate services should be involved in resettlement planning and implementation to ensure that vulnerable groups have access to all services available to them under the laws of Albania (social welfare, education, health care).

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
	greater than 55; families who relocated for employment reasons; orphans under 30 years of age.	be limited in their ability to claim or take advantage of project benefits. Vulnerable individuals and/or groups may also include people living below the poverty line, the landless, the elderly, women and children headed households, refugees, internally displaced people, ethnic minorities, natural resource dependent communities or other displaced persons who may not be protected by national and/or international law.	**GAP/COMMENT**: There are no special requirements in Albanian legislation for organizing consultations and relocation assistance for vulnerable groups. However, persons who are homeless are entitled to social welfare assistance, which includes placement in shelters and access to other services available under national and local social welfare laws. EBRD standards to be applied to this category of PAP;However, no homeless persons are affected by the Project; No relocation is needed for the proposed project; Anyway, the Consultant (with the assistance of the affected municipalities) will scrutinize all potential impacts on the vulnerable groups.
Joint property	Men and women have equal rights in the Republic of Albania (Article 18 of the Constitution of the Republic of Albania and the Law no. 9198 on Gender Equality in Society), including the possibility to have formal legal rights on properties. According to the Family Code of Albania, if formal legal rights over properties / assets have been acquired during the marriage, the law assumes they are shared equally between the spouses, unless a different agreement is formally registered with the court (Articles 73-76).	The documentation for ownership or occupancy, such as title deeds and lease agreements (including the bank accounts established for payment of compensation), should be issued in the names of both spouses or single head of households, as relevant. Other resettlement assistance, such as skills training, access to credit and job opportunities should be made equally available to men and women and adapted to their needs.	Specify in the RAP/LRF that compensation must be shared between spouses according to title documentation or the Family Code in the silence of title documentation. Ensure that all programs, including those related to livelihoods restoration are equally accessible to both men and women (specify in the RAP/LRF).
Legal assistance	There is no requirement for providing free legal assistance to persons affected by expropriation or resettlement, under the Expropriation law. The Government of the Republic of Albania adopted a Law on the provision of free legal aid, which entered into force in April 2009, however not much progress has been made regarding its implementation.	Displaced people shall be offered legal assistance to enable them to complete administrative requirements prior to land acquisition and, if needed, to seek redress from the courts.	Affected people should be informed about and provided with access to free legal assistance, either through municipal departments or through NGOs (specified in the RAP/LRF). **GAP/COMMENT**: Some municipalities have departments that provide free legal assistance to the most vulnerable citizens. Apart from that, there are a number of NGOs in Albania

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
			providing legal assistance, particularly to the most vulnerable groups of population.
Timing compensation	If an agreement on compensation has been reached, the transfer of property and payment / provision of compensation is executed within 15 days from the notification of the affected owner that he/she accepts the offer (Article 16). If not, compensation is provided based on a decision on expropriation of the Council of Ministers, within a period of three months, or after the court decision (Article 23).	Compensation (alternative housing and/or cash compensation) has to be provided prior to relocation.	The RAP should specify that compensation is provided prior to relocation of affected people.
Loss of public amnesties	There is no specific requirement in Albanian legislation for consulting affected communities regarding loss of public amenities.	Where a project involves the loss of public amenities, a meaningful consultation shall be undertaken, in accordance with PR 10, with the locally affected community to identify and, where possible, agree upon a suitable alternative.	The institutions tasked with setting up and maintaining specific public amenities which are affected by land acquisition, should consult local communities on how to replace them (specify in the RAP). **GAP/COMMENT**: There is no specific requirement in Albanian legislation for consulting affected communities regarding loss of public amenities. EBRD standards to be applied to this category of PAP; The Consultant has already taken into consideration this issue. Side roads, underpasses and overpasses will be built to resolve this issue.
Eligibility for compensation / live hood restoration and entitlements in case of economic displacement	The Expropriation law foresees compensation to be paid to those who have formal legal rights for land, buildings of every kind of a permanent nature (Article 8), against fair compensation (Article 2)	If land acquisition causes loss of income or livelihood Category 1 and Category 2, should receive compensation for loss of assets and access to assets, at full replacement cost, replacement property of equal or greater value or cash compensation at full replacement cost. Category 3, should receive: loss of assets other than land, at full replacement cost. All three categories should receive:	Provide assistance to persons in Category 2 to acquire a formal legal status before expropriation (over land and structures), in which case they move into Category 1 and are entitled to compensation as per the Expropriation law. The applicable law is: Law no.9482 on legalization, urban planning and integration of unauthorized buildings (legalization of structures erected on untitled land, except when the land in question is for public purposes) In the case of legalization of structures, the previous

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
		-compensation of the cost for re-establishing commercial activities elsewhere; -compensation for lost net income during the period of transition; -compensation for the costs of the transfer and reinstallation of the plant, machinery or other equipment; -transitional support based on a reasonable estimate of the time required to restore their income-earning capacity, production levels, and standards of living; -additional targeted assistance (credit facilities), training, or job opportunities) and opportunities to affected persons whose livelihoods or income levels are adversely affected (owners of businesses and employees are eligible).	registered owners are entitled to compensation for land as per Law No. 9235 on Property return and compensation. In case of economic displacement, provide those belonging to Category 3 with access to adequate commercial space, with security of tenure, to restore their economic activities and livelihoods. Ensure that all categories are promptly compensated in cash or in kind (before they lose access to their properties / assets), so that lost net income and the need for transitional support are minimized / avoided. Arrange for relocation costs to be compensated in cash or organize transport of equipment and other assets. Facilitate access to existing services which could assist the affected persons whose livelihoods or income levels are adversely affected to restore their living standards. This could be done in cooperation with the Albanian National Employment Service. GAP: Those who belong to Category 2 and Category 3 are not entitled to any compensation or livelihood restoration assistance by the Expropriation law. In addition, all three categories are not entitled to costs of re-establishing commercial activities, lost net income, transitional support, transport of equipment or other targeted assistance. Assistance to off-set any loss of a community's commonly held resource is also not specifically regulated by Albanian legislation. EBRD standards to be applied; The Consultant will pay special attention to the PAP that may be affected from the land use restriction from limitation of the unauthorized crossings. Side roads, underpasses and overpasses will be built to avoid/minimizing land use restriction (e.g. km xxx, kmxxx, etc.)
Grievance procedure	There is no specific requirement for establishing an independent grievance mechanism, according to the Expropriation Law or other Albanian legislation. The law does foresee rights of	An effective grievance mechanism shall be established as early as possible in the process. It will be consistent with this PR and with the objectives and principles of PR 10 in order to receive and address in a timely	Define a project specific grievance mechanism in the RAP/LRF. Depending on the scale of the project or the general vulnerability status of affected families, involve any available

Issue	National regulations	EBRD standard	Standard to be applied / GAP and/or Comment
	affected citizens (those with formal legal rights) to appeal to courts against the decision on expropriation passed by the Council of Ministers, however only with regard to level of compensation they are entitled to (Article 24).	fashion specific concerns about compensation and relocation that are raised by displaced persons and/or members of host communities. It will include a recourse mechanism designed to resolve disputes in an impartial manner.	institutions in the process, e.g. the ombudsman, human rights groups, etc. **GAP/COMMENT**: In practice those with formal legal rights become aware that expropriation is to take place, during the phase of field work and collection of ownership documentation, in preparation of the application for expropriation
Information disclosure and public consultation	According to Article 14 of the Expropriation law, those who have formal legal rights are directly notified about the acceptance of the application for expropriation by the competent Ministry (within 10 days) and invited to negotiate the compensation package. According to Article 15, the application is also published in the Official Journal, in a newspaper with national circulation and in a local newspaper for a period of one week.	The information contained in the RAP and/or the LRF shall be summarized for public disclosure to ensure that affected people understand the compensation procedures and know what to expect at the various stages of the project. Consultation will continue during the implementation, monitoring and evaluation of compensation payment and resettlement so as to achieve outcomes that are consistent with the objectives of this PR.	Plans for consultation with all project affected people, including host communities, should be agreed with them and incorporated in the RAP/LRF. **GAP/COMMENT**: The Expropriation law does not require public consultations to be held with any categories of project affected people, prior to expropriation. Once the expropriation process is initiated, only those with formal legal rights are consulted through a one on one negotiation process. However Albanian Law "On EIA" requires public hearing prior to the delivery of the Environmental Consent; The Consultant (with the assistance of the affected municipalities) will scrutinize all kind of claims on the ownership of the affected land surfaces.
Monitoring	There are no requirements for monitoring the expropriation / resettlement / livelihoods restoration process, under Albanian legislation.	Monitoring of the resettlement and livelihood restoration process will be carried out in accordance with PR 1 and should involve the participation of key stakeholders such as affected communities.	Define indicators and monitoring mechanisms in the RAP / LRF. **GAP/COMMENT**: EBRD standards to be applied.

3.2 Appendix 3.2: Regulations on the EIA report content

EU regulations

According to EIA Directive 2011/92/EU as amended by the Directive 2014/52/EU, the content of an EIA report includes[6]

1. A Description of the project, including in particular:
    a. a description of the location of the project;
    b. a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
    c. a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
    d. an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.
2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort based on the availability of environmental information and scientific knowledge.
4. A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydro morphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
5. A description of the likely significant effects of the project on the environment resulting from, inter alia:
    a. the construction and existence of the project, including, where relevant, demolition works;
    b. the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
    c. the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
    d. the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

[6] Annex IV of the Directive 2014/52/EU

e. the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
f. the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
g. the technologies and the substances used.

6. The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium- term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level that are relevant to the project.

7. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

8. A description of the measures envisaged to avoid, prevent, reduce and where or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

9. A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose if the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

10. A non-technical summary of the information provided under points 1 to 8.

11. A reference list detailing the sources used for the descriptions and assessments included in the report.

National regulations

DCM 912/2015 "On the EIA methodology" provides for the content of a full ESIA report, which includes:

- Non-technical Summary;
- Classification of the proposed project according to preliminary (simplified) or full ESIA;
- Technical description of the project technology, facilities, and activities;
- Project's location and considered alternative;
- Regulatory framework;
- Information on public information and consultation
- Biophysical and Socioeconomic baseline information of the project area;

- Likely potential impacts of project activities, and mitigation measures ;
- Underline transboundary context of the project activities (if any);
- Detailed descriptions about sustainable use of energy, and of natural resources;
- Health and working conditions and likely risk from accidents and preventive mitigation measures;
- Public participation in the decision – making process;
- Potential stakeholders engagement, including affected population, NGOs, official or scientific state agencies/bodies who covers different issues (cultural heritage, forests and pastures, infrastructure objects, urban planning, etc.).

EBRD standards

According to Inception Report and ToR endorsed by EBRD, the proposed project is classified as of Category A according to EBRD criteria. As such, it must fulfil the EBRD Performance Requirements (PRs) as reference standards with regard to the environmental and social strategies (see section 3.2).

The project is classified as of Category A according to EBRD criteria, and as such, a special formalised participatory assessment process is required according to EBRD Standards. The process should include:

- A comprehensive Environmental and Social Impact Assessment in compliance with PR 1 Environmental and Social Appraisal Management and PR 10 Information Disclosure and Stakeholder Engagement;
- An examination of the technically and financially feasible alternatives and the rationale for the alternative selection (PR 1);
- The ESIA Also should identify the issues related to potential risks related to community health, safety and security, as well as labour and working conditions (PRs 2 and 4);
- Implementation within the ESIA of PR3 (Pollution Prevention and Abatement);
- An assessment of involuntary resettlement issues according to PR 5;
- The sustainable use of the natural resources and the protection of biodiversity (PR 6);
- Creating opportunities for Indigenous Peoples to participate in and benefit from project-related activities (PR 7);
- An assessment of impacts on cultural heritage according (PR 8)

3.3 Appendix 3.3: ESIA scoping matrix

Table below constitute the ESIA Scoping matrix, as given in the ESIA scoping report.

Table 3.2_Scoping matrix

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
Air	Construction and transport activities	Local inhabitants; Fauna; Workforce	Stress to local inhabitants and fauna	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their Environmental and Social Management System (ESMS).
Air	Operation	Local inhabitants; Fauna	Stress to local inhabitants and fauna	The whole working area	Out	Trains will use fuel of good quality
Noise and vibrations	Construction and transport activities	Fauna	Stress to fauna	Km 136 to km 140	In	Scoped in with regard to the potential effects to fauna of the MNR of Shkodra Lake
Noise and vibrations	Construction and transport activities	Local inhabitants; Workforce	Stress to local inhabitants	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Noise and vibrations	Operational phase	Local inhabitants	Stress to local inhabitants	Mamurras, Lezhe, Shkoder	In	Scoped in with regard to the potential effects to local inhabitants
Geology and geomorphology	Subsidence	Railway	Physical harm to railway	From km 25-50, km 60-68, and 70-90, the railway substructure is affected from subsidence	In	Scoped in with regards to identifying high risk areas
Geology and geomorphology	Soil Liquefaction	Railway	Physical harm to railway	Km 101 to 103;	In	Railway line located close to an area of high seismic intensity

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
				Areas of seismic activity with high soil saturation levels		
Soils	Accidental spills of oils or chemicals from construction and transport engines	Karst area	Soil contamination from accidental spills of oils due to poor pollution prevention and control measures.	Km 120 to km 140	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Soils	Soil compaction from construction and transport engines	Agricultural land	Deterioration of soil quality from compaction	Working strip both parts of the railway; New station of Lezha; Any eventual road access	In	Scoped in with regard to preserve the quality of agricultural soils.
Soils	Any eventual access roads	Agricultural land	Deterioration of soil quality from compaction	To be determined	In	Scoped in with regard to preserve the quality of agricultural soils.
Soils	Agricultural land surface needed for the construction of the new Lezha station	Agricultural land	Loss of agricultural land, including top soil	Proposed site location for Lezha new station	In	Scoped in with regard to remove *the top soil* and reuse it for improving the quality of agricultural land
Soils	Accidental spills of oils or chemicals from	Agricultural and urban areas	Soil contamination from accidental spills of oils due to	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
	construction and transport engines		poor pollution prevention and control measures.			construction activities as part of their ESMS.
Soils	Accidental spills of oils or chemicals from construction and transport engines	Surface and ground water	Pollution to surface and ground water	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Groundwater	Accidental spills of oils or chemicals from construction and transport engines	Groundwater	Pollution to ground water	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Groundwater	Accidental spills of oils or chemicals from construction and transport engines	Aquifers used for drinking water supply; Drinking water consumers	Pollution to ground water	Recharge areas (perched aquifers): crossings of Mati River bed; Upper Shkodra Aquifer; Kopliku Aquifer; Karst areas	In	Scoped in with regard to contamination of the aquifers used for drinking water supply and which are overlaid by permeable deposits
Groundwater	Accidental spills of oils or chemicals from construction and transport engines	Surface water	Pollution to surface water	Surface waters feed by ground waters: Shkodra Lake, hydro monuments of Syri Zi, Syri Sheganit)	In	Scoped in with regard to contamination of the designated surface water bodies
Surface Waters	Accidental spills of oils or chemicals from construction and	Surface Water quality; Aquatic flora/fauna	Pollution to surface water	Crossed surface waters	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their HSE-MS.

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
	transport engines					
Surface Waters	Accidental spills of oils or chemicals from construction and transport engines	Surface Water quality; Aquatic flora/fauna	Pollution to surface water	Water bodies receiving rivers and streams – Shkodra Lake	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Flooding	Construction and operation	Railway line	Railway damaged and/or inundated	From Lezha to Baqel	In	Scoped in with regard to the potential effects of the inundation to the railway
Terrestrial biodiversity	Construction and transport activities	Terrestrial flora	Damage to terrestrial flora and vegetation	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Terrestrial biodiversity	Construction and transport activities	Terrestrial flora	Damage to terrestrial flora and vegetation	Km 135 to km 140	In	Scoped in with regard to the potential effects to the forested area covering the karst plain in the north of Bajze.
Aquatic biodiversity	Construction and transport activities	Aquatic flora and fauna	Damage to aquatic biodiversity	Km 138 to km 140	In	Scoped in with regard to the potential effects to the Shkodra Lake water quality
Aquatic biodiversity	Construction and transport activities; Noise	Migratory birds	Stress to migratory birds	Km 138to km 140	In	Scoped in with regard to the potential effects to the migratory birds of the MNR of Shkodra Lake
Climate change	Construction and transport activities	Railway line	Railway inundated	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
Climate change	Operation	Railway line	Railway damaged and/or inundated	From Lezha to Baqel	In	Scoped in with regard to the potential effects of the inundation to the railway
Traffic	Construction and transport activities	Local inhabitants; Car users	Traffic interruption	Level crossings – secondary and tertiary roads	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Traffic	Construction and transport activities	Local inhabitants; Car users	Traffic interruption	Level crossings – national roads	In	Scoped in with regard to the potential effects to traffic in national roads
Infrastructure	Construction activities	Underground infrastructure (water pipelines, electric cables, etc.)	Damage to infrastructure	To be determined	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Drainage and irrigation system	Construction and transport activities	Landowners, local inhabitants	Damage to drainage and irrigation system	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Drainage and irrigation system	Construction and transport activities	Landowners, local inhabitants	Damage to drainage and irrigation system	To be determined	In	Scoped in with regard to the potential effects to the drainage system and to the agriculture
Landscape	Construction and transport activities	Local inhabitants	Impact to landscape	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Landscape	Operation	Local inhabitants	Impact to landscape from	To be determined	Out	The beneficiary will apply Good International Practice (GIP) to their

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
			increase of the high of the railway line			construction activities as part of their ESMS.
Landscape	Operation	Local inhabitants	Impact to landscape from construction of new underpasses and overpasses	To be determined	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS..
Landscape	Operation	Local inhabitants	Impact to landscape from construction of noise barriers	Across the densely inhabited area	In	Scoped in with regard to the construction of any environmental friendly noise barriers
Agriculture	Construction and Operation	Local farmers	The railway serves as an embankment for the rainy waters	To be determined	In	Scoped in with regard to avoid this potential negative impact
Agriculture	Construction and transport activities	Local farmers	Damage to agriculture from construction and transport activities	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Land use	Construction and Operation	Landowners	Land surface required for Lezha station	Location of the proposed new station of Lezha	In	Scoped in with regard to land surface required for the new Lezha station
Land use	Construction and Operation	Landowners, local inhabitants	Land surface required for side roads	To be determined	In	Scoped in with regard to land surface required for the new side roads

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
Land use	Construction and Operation	Landowners, local inhabitants	Land surface required for underpasses and overpasses	To be determined	In	Scoped in with regard to land surface required for the new underpasses and overpasses
Land use	Construction and Operation	Landowners	Land use restriction	To be determined	In	Scoped in, because the railway line is located between the agricultural land and the farmhouses
Solid waste	Construction activities	Local inhabitants	Impact on landscape; on the quality of the environment; on agriculture	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.
Solid waste	Construction activities	Local inhabitants	Impact on landscape; on the quality of the environment; on agriculture	The railway subgrade is filled with material of poor quality (km 21-25 and km 90- 98), which will be replaced by good material	In	Scoped in with regard to impacts to environment and the locations where the solid waste should be deposited
Cultural heritage	Construction activities	Cultural heritage	Possible damage to archaeological objects	To be determined	In	Scoped in with regard to land surface required for the new Lezha station, side roads and underpasses and overpasses
Vulnerable people	Construction and Operation	Vulnerable PAP	Difficulties to be fairly compensated for the land and livelihood	The whole working area	In	Scoped in with regard to the difficulties this category of person may face for being correctly compensated

ESIA Topic	Source of Impact	Receptor(s)	Impact	Key Receptor Sensitivities	Scoped In/Out	Justification for Scoped In/Out
Human health	Construction activities	Local inhabitants; Workforce	Impact on health	The whole working area	Out	The beneficiary will apply Good International Practice (GIP) to their construction activities as part of their ESMS.

3.4 Appendix 3.4: Administrative procedure and necessary documentation for obtaining the Environmental Declaration

Starting from January 2020, the request for the environmental permit shall be done electronically via the government portal e-Albania[7].

DCM 686/2015, as amended in 2019, provides for the necessary documentation and timing.

The timing is as follows:

- Notification on full EIA: 45 days;
- Delivery of Environmental Declaration: 60 days;

The Environmental Declaration is valuable only for two years. If the construction do not start within two years after the delivery of the Environmental Declaration, the ESIA process must restart from the beginning.

[7] https://e-albania.al/eAlbaniaServices/UseService.aspx?service_code=13278

4 Appendices related to chapter 4

4.1 Appendix 4.1: none

5 Appendices related to chapter 5

5.1 Appendix 5.1: Key ambient air pollutants and sources of pollution

Key air pollutants

According to the European Environmental Agency[8], air pollutants may be categorised as primary or secondary. Primary pollutants are directly emitted to the atmosphere, whereas the secondary ones are formed in the atmosphere from precursor pollutants through chemical reactions and microphysical processes.

Key primary air pollutants include particulate matter (PM), black carbon (BC), sulphur oxides (SO_X), nitrogen oxides (NO_X) (which includes both nitrogen monoxide, NO, and nitrogen dioxide, NO_2),ammonia (NH), carbon monoxide (CO), methane (CH_4), non-methane volatile organic compounds (NMVOCs), including benzene (C_6H_6), certain metals and polycyclic aromatic hydrocarbons (PAHs) including benzo[a]pyrene (BaP).

Key secondary air pollutants are PM (formed in the atmosphere), ozone (O_3), NO and several oxidized volatile organic compounds (VOCs). Key precursor gases for secondary PM are sulphur dioxide (SO_2),NO_X, NH3, and VOCs. Gases SO_2, NO_X and NH react in the atmosphere to form particulate sulphate (SO), nitrate (NO_3^-) and ammonium (NH) compounds. These compounds form new particles in the air or condense onto pre-existing ones to form secondary inorganic PM. Certain NMVOCs are oxidised to formless volatile compounds, which form secondary organic aerosols. Ground-level (tropospheric) O_4^+ is not directly emitted into the atmosphere. Instead, it is formed from chemical reactions in the presence of sunlight, following emissions of precursor gases, mainly NO, NMVOCs, CO and CH. These can be of both natural (biogenic) and anthropogenic origin. NO_X in high-emission areas also depletes tropospheric Ozone as a result of the titration reaction with the emitted NO to form NO_3 and oxygen.

Key sources of pollution

According to the European Environmental Agency, the sources of the main substances polluting the ambient air are as follows[9]:

- PM_{10} and $PM_{2.5}$: primary particulate matter (PM) originates from both natural and anthropogenic sources, and is commonly classified as either primary PM_{10} or primary $PM_{2.5}$. Natural sources include sea salt, naturally suspended dust, pollen and volcanic ash, while anthropogenic sources include fuel combustion for power generation, domestic heating and transport, industry and waste incineration, and agriculture, as well as brakes, tyres and road wear and other types of anthropogenic dust. Black carbon is a constituent of $PM_{2.5}$ formed from incomplete fuel combustion, with the main sources including transport and domestic heating.
- BaP (benzo[ȧ]pyrene): gas emitted as a result of the incomplete combustion of fossil fuels and biofuels. The main sources of BaP are domestic heating (in particular wood and coal burning), waste burning, coke production and steel production. Other sources include outdoor fires, road traffic and rubber tyre wear.
- NO_x: the main sources of nitrogen oxides (NO_x) are combustion processes, which may be either stationary or mobile. Nitric oxide (NO) accounts for the majority of NO_x emissions: NO is subsequently oxidised to form NO_2, although some NO_2 is emitted

[8] https://www.eea.europa.eu//publications/air-quality-in-europe-2019

[9] https://www.eea.europa.eu/publications/air-quality-in-europe-2017

directly. The proportion of NO_2 (i.e. the NO_2 /NO_x ratio) in vehicle exhaust is considerably higher in diesel vehicles than in petrol-fuelled vehicles, because their exhaust after-treatment systems increase the oxidation of NO, thus generating higher direct NO_2 emissions.

Based on the above, it can be assumed that the air quality alongside the railway line is affected mainly from traffic and construction activities.

Besides, the quality of the fuels used for transport and working engines is not always within the required standards and therefore the fuel combustion is a source of BaP and NOx.

It should be stated that the improvement of the road network quality and the decrease of the construction of new buildings will contribute to the improvement of the air quality. The boom of construction activities is already almost stopped and the road infrastructure within the new urbanized areas is improving.

5.2 Appendix 5.2: Ground (subsoil) types according to Eurocode 8

According to Eurocode 8 (§3.1.2), there are five typical ground/soil types (A, B, C, D, E) and 2 special ground types (S_1, S_2) that may be used to account for the influence of local ground conditions on the seismic action. The average shear wave velocity in the top 30 m from the surface is computed according to the following equation: (EC8 § 3.1.2 (3))

$$v_{s,30} = \frac{30}{\sum_{i=1,N} \frac{h_i}{v_i}}$$

where

h_i and v_i denote the thickness (in meters) and the shear wave velocity (at a shear strain level of 10^{-5} or less) for the i-th formation or layer, in a total of N.

If the value of $v_{s,30}$ is not available, the number of block outs per 0.3 m in N_{SPT} test can be used. If this number is not available either, the undrained cohesion c_u can be used. The following table presents the description of each ground type, and the definition parameters.

Table 5.1_ Ground/soil types according to Eurocode 8 (EC8 § 3.1.2 Table 3.1)

Ground type and description	$v_{s,30}$	N_{SPT}	c_u
A: Rock or other rock-like geological formation, including at most 5 m of weaker material at the surface.	>800	-	-
B: Deposits of very dense sand, gravel, or very stiff clay, at least several tens of meters in thickness, characterized by a gradual increase of mechanical properties with depth.	360-800	>50	>250
C: Deep deposits of dense or medium dense sand, gravel or stiff clay with thickness from several tens to many hundreds of meters.	180-360	15-50	70-250
D: Deposits of loose-to-medium cohesionless soil (with or without some soft cohesive layers), or of predominantly soft-to-firm cohesive soil.	<180	<15	<70

E: A soil profile consisting of a surface alluvium layer with *vs* values of type C or D and thickness varying between about 5 m and 20 m, underlain by stiffer material with *vs* > 800 m/s.			
S1: Deposits consisting, or containing a layer at least 10 m thick, of soft clays/silts with a high plasticity index (PI > 40) and high water content	<100	-	10-20
S2: Deposits of liquefiable soils, of sensitive clays, or any other soil profile not included in types A – E or S_1			

5.3 Appendix 5.3: Baseline information in habitats and species of conservation concern

5.3.1 Introduction

The following analysis has been conducted in accordance with the EBRD Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

This Performance Requirement (PR) is based in three main principles:

1. This PR recognizes that the conservation of biodiversity and sustainable management of living natural resources are fundamental to environmental and social sustainability.
2. This PR recognizes the importance of maintaining the core ecological function of habitats, biodiversity and ecosystem services. All ecosystems support a complexity of living organisms and vary in terms of richness, abundance and importance of species.
3. The objective of biodiversity conservation and sustainable management of living resources must be balanced with the potential for utilizing the multiple economic, social and cultural values of biodiversity and living natural resources in an optimized manner.

Based on the above, the main goal of this analysis is the determination of Priority Biodiversity Features and Critical Habitats in the area of Project's influence.

As the railways goes mostly through arable land, this analysis was conducted mainly for areas of ecological sensitivity including river sections crossed by the railway line as well as areas of conservation importance such as the Nature Managed Reserve of Lake Shkoder, the Ramsar Site Shkoder Lake-Buna River, the Important Bird Area of Lake Shkoder, the Key Biodiversity Area of Shkoder Buna and the Candidate Emerald Site of Shkoder Lake.

5.3.2 Methodology

The biodiversity assessment approach is based in the EBRD Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

5.3.2.1 EBRD PR 6 and the "priority biodiversity features"

In accordance with paragraph 12 of the EBRD PR 6, some areas affected by the Project may be considered "priority biodiversity features" which include:

i. threatened habitats;

ii. vulnerable species;

iii. significant biodiversity features identified by a broad set of stakeholders or governments (such as Important Bird Areas, Key Biodiversity Areas); and

iv. ecological structure and functions needed to maintain the viability of priority biodiversity features described above.

EBRD PR6 specifically defines "critical habitats" as the most sensitive biodiversity features, which comprise one of the following:

i. highly threatened or unique ecosystems;

ii. habitats of significant importance to endangered or critically endangered species;

iii. habitats of significant importance to endemic or geographically restricted species;

iv. habitats supporting globally significant migratory or congregatory species; or

v. areas associated with key evolutionary processes.

The analysis and biodiversity assessment covers the following:

- Review all existing relevant documentation, supporting baseline information and any other relevant reports / datasets to assess the adequacy of this information;
- Based on existing information, complete a Critical Habitat / Priority Biodiversity Features screening to help identify whether (i) habitats and or species of conservation importance could be impacted by the Project and (ii) additional baseline surveys are warranted. It will also be identified whether there are any other material gaps within the existing biodiversity impact assessment that need to be addressed;
- Criteria for for identifying key biodiversity features

5.3.2.2 Criteria for identifying key biodiversity features

The following criteria are proposed to identify the key biodiversity features (habitats and species).

Habitats:

- Included in the EU Habitats Directive – Annex 1 Priority Habitats
- Core and suitable habitats for species that meet the criteria indicated below:

Species:

- Listed in EU Birds Directive (Annexes 1, 2.1 and 2.2);
- Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats – Annexes I, II and III);
- CITES Convention (Convention on International Trade in Endangered Species of Wild Fauna and Flora – Annexes I, II and III);
- Included in the IUCN Red List at Global level;
- Included in the IUCN Red List at European level;
- Threatened species at Mediterranean level (after the IUCN criteria);

- Included in EU Habitats Directive (Annexes 2, 4 and 5), noting any priority species (priority species means species for the conservation of which the Community has particular responsibility in view of the proportion of their natural range which falls within the territory referred to in Article 2; these priority species are indicated by an asterisk (*) in Annex II);
- Species included in the National Red List (with an IUCN status); and
- National or regional (Balkan) endemic species.

5.3.3 Baseline information on Shkoder Lake Watershed and Nature Managed Reserve

Shkoder Lake and its watershed represent a complexity of habitats with high diversity of living organisms. These characteristics are related to water regime, which changes according to seasons and fluctuations of water volume.

5.3.3.1 Habitants and Plants

Aquatic Habitants and Plants

Shkoder Lake watershed has three main aquatic habitat systems:

- the lacustrine habitat system;
- the palustrine habitat system; and
- the riverine / fluvial system.

So far 60 plant associations are known: 6 associations are of Scirpeto – Phragmitetum, 4 associations are of *Najadetum marina*, *Nymphoidetum peltatae*, *Nympheetum albo*, *Sparganio -Glicerietum fluitantis*.

The highest number of species is from the associations of *Potametum perfoliati* found between 1-3m, *Nympheetum albo–lutea, Sparganio – Glicerietum fluitantis* and *Scirpeto – Phragmitetum*.

One of the most important submerged algae communities in the Shkoder Lake are the Charophytes or stoneworts (Charales, Characeae). This community is of great importance for the environmental and economic sustainability of the aquatic ecosystem of Shkoder Lake.

Terrestrial habitats and plants

The terrestrial habitats and plants of the Shkoder Lake watershed are as follows:

Macchia zone is situated up to 400 – 500 m above sea level. The most common trees and shrubs in this area are *Quercus ilex, Phillyrea latifolia*, *Juniperus oxycedrus*, *Erica arborea* etc.

Oak zone is situated between 300-700 m above sea level and is known for the following species: *Quercus trojana*, *Quercus cerris*, *Quercus petraea*, *Quercus frainetto*, *Quercus pubescens* etc.

Beech zone is situated between 600 - 1,700 m above sea level, which together with conifer subzone reaches 1900 m. The most common species are *Fagus silvatica*, *Acer pseudoplatanus*, *Sorbus graeca* and shrubs *Cotoneaster integerrimus*, *Rubus idaeus*, *Vaccinium myrtillus* etc.

The alpine pastures are situated between 1800 -1900 m above sea level. Some genera and species of these pastures are *Rosa sp*, *Juniperus sabina*, *Salix retusa*, *Poa sp.*, *Festuca sp.*, *Sesleria sp.*, *Luzula italica*, *Bromus sp.*, *Koeleria sp.*, *Gentiana verna*, *Gentiana lutea*, *Astragalus purpureus*, *Anthyllis aurea*, *Campanula sp.*, *Silene macrantha*.

5.3.3.2 Fauna of the Lake and its watershed

Invertebrates

Shkoder Lake is characterized by a relatively high diversity of invertebrate species. This is related to the diversity of habitats and microhabitats in the lake, plants and algae, as well as substrata typologies. More than 450 aquatic invertebrate species have been reported from the lake, apart from protozoans and rotifers.

Cnidarians (Cnidaria): they are represented by two species, of which one is autochtonous, the brown hydra *Hydra oligactis* and one alien species, the freshwater jellyfish *Craspedacusta sowerbii*.

Sponges (Spongia): they are represented by one species only, *Spongilla lacustris*.

Flatworms (Platyhelminthes): 31 species are known from which 6 Cestods and 25 Trematods (parasites of fish and water birds).

Nematodes (Nematoda): 11 parasitic species have been reported from the lake.

Rotifers (Rotifera): 51 planktonic and benthic species have been reported, where the families Brachionidae, Gastropodidae, Lecanidae, Synchaetidae and Trichocercidae are the predominant ones.

Acanthocephalan (Acanthocephala): 7 parasitic species are known from the lake.

Molluscs (Mollusca): the list of molluscs of Shkoder Lake and the surrounding aquatic bodies (springs, wetlands, underground waters) includes 91 species. 76 species are gastropods (snails) and 15 species are bivalves (mussels).

The richest families in species number are Hydrobiidae (26), Planorbidae (19), Lymnaeidae (13), Sphaeriidae (7) and Unionidae (7). 65 species have been found in the lake, in its sublacustrine springs, ponds with direct connection to the lake, lowest part of the lake tributaries and upstream part of Buna River. The other 26 species have been found in springs and underground waters connected to the lake. 28 mollusc species are endemic to the Shkoder Lake and to its related aquatic habitats.

Bryozoans (Bryozoa): they are represented by two species in the lake, *Plumatella repens* and *Cristatella mucedo*. They are colonial forms and grow attached to aquatic vegetation, stones, as well as to organic or artificial firm substrata.

Oligochaetes (Oligochaeta) – annelid worms: a total of 35 species of Oligochaeta have been recorded so far in Shkoder Lake. They belong to the families Naididae, Lumbriculidae and Criodriliidae. Among them, three species are endemic to Shkoder Lake: *Spirosperma scodraensis, Tubificidarum hrabei*, and *Trichodrilus montenegrinus*.

Leeches (Hirudinea): leeches belong to another group of annelid worms and they are represented by 15 species in the Shkoder Lake. Most of the leech species inhabit the lake, but some species are only reported from the sublacustrine environment (*Glossiphonia paludosa, Glossiphonia pulchella*). Two species *Dina dinarica* and *Trocheta dalmatina* inhabit nearby springs.

Crustaceans (Crustacea): at least 110 crustacean species have been reported from the lake, of which 34 are Malacostraca. Cladocera, Amphipoda and Copepoda are the groups with the highest number of species. Decapods are represented by 8 species: *Astacus astacus, Austropotamobius torrentium, Austropotamobius italicus meridionalis*, *Atyaephyra desmaresti, Palaemonetes antennarius, Potamon fluviatile, Troglocaris prasence* and *Troglocaris hercegovinensis.* Branchiopods are the richest group with 36 species, of which 22 are from Eurycercidae family. 22 species of Ostracoda are known, of which 11 belong to Candonidae. Copepods are represented by 18 species, of which 11 are from Cyclopedidae family. The

problems with taxa synonymies have not been fully resolved and the list of crustaceans' species of Shkoder Lake has not been definitive yet, which makes difficult stating the endemic species. However, it has been clearly stated that 12 species of Malacostraca are endemic to the Lake, one belonging to Mysidacea, one to Isopoda and 10 to Amphipoda, of which 8 species belong to the genus *Niphargus (N. asper, N. brevicuspis sketi, N. inclinatus, N. maximus vulgaris, N. podgoricensis, N. vranjine, N. zorae, N. kusceri)*.

Insects (Insecta): They represent a very interesting group of Shkoder Lake. Until now, no complete study is done for the Shkoder Lake catchment's area insects. The orders with the highest number of species are Coleoptera, Lepidoptera, Hymenoptera, Diptera, Hemiptera and Orthoptera. Their majority is represented by species that have benthic larval phase. Some figures from the most studied insects' groups in Shkoder Lake and its catchment are given in the following. 35 species of Ephemeroptera (Mayflies), 60 species of Plecoptera (stoneflies) and 55 species of Trichoptera have been recorded. 60 species of Odonata (dragonflies), of which 23 in the lake water, and 14 species are threatened at the European and Mediterranean level. From Coleoptera (beetles), 14 species of diving beetles (Dytiscidae), 1 species of burrowing water beetles (Noteridae), and 1 species of whirligig beetle (Gyrinidae) (Orectochilus villosus) are known from Shkoder Lake and its associated water bodies. In the surrounding streams, Elmidae and Hydraenidae can be found, some of them, such as Ochthebius insidiosus (Hydraenidae) described from Rijeka Crnojevića, being endemic. Hemiptera (water bugs), are represented with 10 species in the lake. True flies (Diptera) are one of the most important and most diverse groups of benthic macroinvertebrate fauna. There are more than 20 families known from Shkoder Lake and its surrounding water bodies. Chironomidae (midges) are represented with 31 species of nonbiting midges from the lake itself and 24 species from springs. The most recent studies speculate that this number is an underestimate and that the taxonomic diversity of nonbiting midges in the Lake basin is much higher. This phenomenon might be caused by the occurrence of cryptic species in some genera or rarely by misidentification among morphologically similar taxa. Culicids (mosquitoes) are represented by several species, of which some are potential vectors of malaria (*Anopheles saccharovi, Anopheles maculipennis*), chikungunya virus and dengue virus (*Aedes albopictus*), and West Nile virus and Rift Valley fever virus (*Culex pipiens*). The invasive Asian tiger mosquito (*Aedes albopictus*) has recently been reported from the Shkoder Lake basin.

Vertebrates

Fish (Pisces): The ichthyofauna of Shkoder Lake consists of 59 species belonging to 18 families (17 of which are native), including diadromous, euryhaline and introduced species. Of these, 44 are native to the watershed, whereas 15 are introduced. Seven species are endemic: *Ninnigobius montenegrensis, Knipowitschia montenegrina, Barbatula zetensis, Rutilus albus, Gobio skadarensis, Salmo zetensis* and *Chondrostoma scodrense* – extinct (EW). The most diverse family is Cyprinidae with 24 (of which 16 are native) species, followed by Mugillidae (5), and Gobiidae (4). Fish in the Shkoder Lake and its watershed have significant economic potential. The following species are fished for commercial purposes: Bleak (*Alburnus scoranza*), Carp (*Cyprinus carpio*), Goldfish (*Carassius auratus*), Eel (*Anguilla anguilla*), Skadar Rudd (*Scardinius knezevici*), Skadar Chub (*Squalius platyceps*), Ohrid Nase (*Chondrostoma ohridanum*), White Roach (*Rutilus albus*), Spotted Roach (*Pachychilon pictum*), Yellow Roach (*Rutilus prespensis*), all species of Mugilidae, Alosa sp., Sea Bass (*Dicentrarchus labrax*), European Perch (*Perca fluviatilis*) and Flounder (*Pleuronectes flesus*).

Regarding their conservation status (after the IUCN categories), the largest number of fish species (30.5%) have the LC status, but one third of the species are in a certain category of threat (33.3%), and those are mainly those species endemic to the Adriatic watershed. Three species

(5.1%) are classified as critically endangered (CR), and three others (5.1%) are endangered species (EN), while four (6.8%) are vulnerable (VU).

Amphibians (Amphibia): 15 amphibian species have been reported from Shkoder Lake and its tributaries. 6 of these species are from Ranidae family (*Pelophylax kurtmuelleri, Pelophylax ridibunda, Pelophylax shqiperica*, *Rana dalmatina, Rana graeca, Rana temporaria*). 5 species are tailed amphibians of the Family Salamandridae (*Lissotriton vulgaris, Mesotriton alpestris, Triturus karelini*, *Salamandra salamandra, Salamandra atra*). 2 species belong to the Family Bufonidae *(Bufo bufo* and *Bufo viridis),* one species belongs to Family Bombinatoridae *(Bombina variegata)* and one species to Family Hylidae *(Hyla arborea).* From these species, 9 have been found in the Lake, while the other 6 species have been reported from the lake watershed.

Concerning their endangered status at European level, 14 species have the LC status, whereas one species *(Pelophylax shqiperica)* has the EN status.

Reptilians (Reptilia): 36 species of reptiles have been reported from Shkoder Lake and its catchment area. 4 species have been found within the lake (*Emys orbicularis, Mauremys rivulata, Natrix natrix, Natrix tessellata*), while the others in the lake catchment. 3 species are turtles (belonging to Chelonia of the families Testudinidae and Emydidae), 18 species belong to Sauria and 15 species belong to Serpentes. The most common species belong to families Gekkonidae, Lacertidae, Anguidae, Typhlophidae, Colubridae and Viperidae. Only two reptile species are globally endangered, namely the *Dinarolacerta mosorensis* and *Vipera ursinii*, both having VU status. None of them occur sin the project area of influence.

Birds (Aves): In Shkoder Lake and its catchment 282 bird species have been reported, which count for 55 % of the total number of bird species in Europe. From this total, 112 are aquatic species (waterfowl). The orders with the highest number of species are Passeriformes (107), especially with the families Sylviidae (20), Turdidae (15), Fringillidae (10) and Motacillidae (9); Charadriiformes (46) with the Family Scolopacidae (19); Anseriformes (29), Accipitriformes (21), Ciconiiformes (14), Gruiformes (10) etc. 178 species (63 %) are wintering species, of which 68 species are waterfowl (24% of the total number of species). Migration is well expressed in aquatic species, especially in Ciconiiformes and Anseriformes. 189 species (67 %) are nesting species, of which 46 species are aquatic (16,3 % of the total number of species). Shkoder Lake is especially important concerning the bird colonies, where the most important are: the colony of Dalmatian Pelican (*Pelecanus crispus*), the colony of Cormorants (*Phalacrocorax carbo* and *Microcarbo pygmaeus*), the colony of Whiskered Tern (*Chlidonias hybrida*) and the colony of Grey Heron (*Ardea cinerea*).

Mixed colonies, too, are usual in the lake and its surrounding waters. The predominant species in the mixed colonies are the Pigmy Cormorant (*Microcarbo pygmaeus*), the Squacco Egret (*Ardeola ralloides*), the Little Egret (*Egretta garzetta*), the Night Heron (*Nycticorax nycticorax*), the Grey Heron (*Ardea cinerea*), and the Cormorant (*Phalacrocorax carbo*). In recent years, some new breeding birds appeared on Shkoder Lake, like the Glossy Ibis (*Plegadis falcinellus*) and the Cattle Egret (*Bubulcus ibis*).

Due to high species richness and high number of nesting birds, the Shkoder Lake has been designated a Ramsar site (Ramsar Convention on Wetlands of International Importance especially as Waterbirds Habitat).

Mammals: 57 species of mammals have been reported from Shkoder Lake and its catchment area. The order Chiroptera (bats) is known for the high number of species (20). 10 species belong to Insectivora, 1 species to Lagomorpha, 12 species to Rodentia, 11 species to Carnivora and 3 species belong to Artiodactyla. Only 3 species are semi-aquatic species, from which the Eurasian otter *(Lutra lutra)* is the most important. The two other semi-aquatic mammal species are the Eurasian Water Shrew (*Neomys fodiens)* and the European water vole *(Arvicola terrestris)*.

5.3.3.3 Species of conservation concern

Endemic, Rare and Threatened Flora

A characteristic element of the vascular flora of the Shkoder Lake basin is the presence of a large number of endemic species, some of them being protected at the international and national level. Altogether, 40 species and subspecies endemic to the Balkan Peninsula have been recorded in the flora of the Shkoder Lake area.

A large number of Balkan endemic species were found on the slopes of Mount Rumija and are characteristic of the vegetation of rock crevices and screes (*Cymbalaria ebelii, Ramonda serbica, Moltkia petraea, Teucrium ardunii, Stachys menthifolia, Seseli globiferum, Cardamine rupestris, Crepis bertiscea, Edraianthus tenuifolius* and *Campanula austroadriatica*). Other species like *Onosma stellulata, Sideritis romana subsp. purpurea*, and *Vincetoxicum huteri* are characteristic of the vegetation of Mediterranean grasslands and herblands, while *Succisella petterii* is characteristic of wet meadows.

From the green macroalgae Characea, the Balkan endemic species *Chara ohridana* has been recently reported from Shkoder Lake as a new finding site (Blazencic et al., 2018).

Some of the endemic plant taxa are located within the border of the Shkoder Lake Protected Area. *Minuartia mesogitana subsp. velenovskyi* was described (as *Alsine tenuifolia var. velenovskyi*) from Godinje near Virpazar; *Cymbalaria ebelii* was described (as *Linaria microcalyx subsp. ebelii*) from Vranjina island.

The national and/or international conservation status of plant species and plant communities in the area of Shkoder Lake has been a subject of several assessments. Table 5.2 belowrepresents a list of plant species of special conservation concern, referring to species with an international threatening status, as included in: 1) the IUCN Red List at global scale; 2) the EU Habitat Directive; 3) the Bern Convention; and 4) the CITES Convention.

Table 5.2_ List of plant species of special conservation concern

Name of taxa	IUCN Red List Global	Habitat Directive Annex	Bern Annex	CITES Annex
Marsilea quadrifolia		II, IV	I	
Cyclamen hederifolium				II
Edraianthus dalmaticus		II, IV		
Anacamptis coriophora				II
Anacamptis morio caucasica				II
Anacamptis morio morio				II
Anacamptis morio picta				II
Anacamptis palustris				II
Anacamptis papilionacea				II
Anacamptis pyramidalis		II, IV		II
Dactylorhyza incarnata incarnata				II
Gymnadenia conopsea				II
Himantoglossum caprinum		II, IV		II
Limodorum abortivum				II

Name of taxa	IUCN Red List Global	Habitat Directive Annex	Bern Annex	CITES Annex
Neotinea tridentate				II
Ophrys apifera				II
Ophrys bertolonii				II
Ophrys scolopax cornuta				II
Ophrys sphegodes sphegodes				II
Orchis pauciflora				II
Orchis provincialis				II
Orchis quadripunctata				II
Orchis simian				II
Platanthera bifolia				II
Serapias lingua				II
Serapias vomeracea vomeracea				II
Spirantes spiralis				II
Caldesia parnassifolia		II, IV	I	
Galanthus nivalis		V		II
Narcissus poeticus radiiflorus			I	
Najas flexilis		II, IV	I	
Ramonda serbica		IV	I	
Ruscus aculeatus		V		
Trapa natans			I	

Endemic, Rare and Threatened Fauna

Shkoder Lake and its basin, representing the classic karst of the Dinarides with a very complex hydrogeology, are unique areas with high landscape heterogeneity and rich species diversity, including numerous endemic species from various taxonomic groups. However, the endemism in lacustrine species (species found within the lake basin only) is low, whereas the rate of endemism is generally higher in the lake catchment area.

Molluscs are the group with the highest number of endemism from the animal groups of the Shkoder Lake catchment. Different publications have stated different numbers for the endemic species. The highest number of endemic molluscs has been published by Dhora (2016), mentioning 28 endemic species from the whole lake watershed. Hydrobiid gastropods are the mollusc group with the highest endemism. Around 82% of the hydrobiid species that inhabit the Shkoder Lake catchment area are known only from the type localities in this area. Only two endemics, *Radomaniola (Orientalina) lacustris* and *Vinodolia (Anagastina) scutarica*, are considered as typically lacustrine forms, while the rest of species belong to the waterbodies in the Lake catchment. All 28 species of endemic molluscs of the Lake watershed belong to the Red List of Fauna of Albania (2013) and 44 molluscs species have a threatened status after the IUCN Red List at Global Scale, as shown in the Table 5.3 below

Table 5.3 Number of threatened molluscs species from Shkoder Lake watershed for each category of the IUCN Red List at Global Scale

IUCN category		Nr. of species
Critically endangered	CR	5
Endangered	EN	9
Vulnerable	VU	1
Near threatened	NT	3
Least concerned	LC	23
Data deficient	DD	3
Threatened molluscs in total		44

Oligochaetes, although with a relatively high number of species found in the lake (35 in total) represent a low rate of endemism, with species only: *Spirosperma scodraensis, Tubificidarum hrabei*, and *Trichodrilus montenegrinus*.

Malacostraca crustaceans are the second known animal group with respect to the number of local endemics at the morphological species level, after the gastropod molluscs. The definitive majority of this endemic diversity is associated with the subterranean karst habitats and represented by various *Niphargus* species. It is important to mention that recent molecular studies on Balkan malacostracans have revealed substantial cryptic diversity within the conventionally described morphospecies. Thus, the diversity and endemism of the Shkoder Lake malacostracans may be even higher that is currently believed.

Amphipoda is the group with the highest number of endemic species among malacostracans, with 10 species, of which 8 belong to the genus *Niphargus (N. asper, N. brevicuspis sketi, N. inclinatus, N. maximus vulgaris, N. podgoricensis, N. vranjine, N. zorae, N. kusceri)*. The two other endemic amphipods are *Laurogammarus scutarensis* and *Bogidiella montenegrina*.

From the other malacostracans, mysids (Mysidacea) are represented by one endemic species only, *Diamysis lacustris*, and isopods with one endemic species, too, *Sphaeromides virei montenegrina*.

Endemic copepods are represented mainly by harpacticoids that inhabit underground water habitats, such as *Nitocrella longa, Moraria jana, Ceuthonectes petkovskii, Elaphoidella montenegrina, Elaphoidella gordani* and *Elaphoidella uva*, as well as the calanoid *Stygodiaptomus ferus* that have been reported from several caves and springs, most of them as stygobiotic species.

Ostracods are represented by several endemic forms, mainly stygobiotic species, too, of which four species are endemic known only from its *locus typicus*: *Pseudocypridopsis petkovskii, Trajancandona particular, Trajancandona natura* and *Typhlocypris skadari.* Four other endemic species *Pseudocandona regisnikolai, Leptocythere pseudoproboscidea, Candona forma* and *Candonopsis mareza* have been reported from various habitats around the Shkoder Lake watershed.

From water mites (Acarina: Hydrachnidia), *Trichothyas jadrankae* is endemic to the Shkoder Lake basin, while three other species are endemic to Montenegro: *Torrenticola lukai, Atractides longisetus* and *Stygohydracarus karanovici*. The last one is a typical inhabitant of hyporheic interstitial, although the interstitial fauna of the Shkoder Lake catchment does not exhibit marked endemism.

Insects are supposed to include endemic and sub endemic forms, encompassing more than 100 species, most of them terrestrial adults, for the whole Shkoder Lake catchment area, whereas aquatic insects represent a very low rate of endemism for the Lake itself. However, several insect groups are poorly studied, especially in the Albanian part of the Lake, and considerations about endemic forms should be treated very carefully. More than half of the stonefly species (Plecoptera) of the Shkoder Lake catchment area are Balkan endemic or sub endemic taxa, with the others showing European or Eurosiberian distribution. *Capnioneura balkanica balkanica* is an endemic species that inhabits spring habitats. It seems to be a winter-emerging endemic of the Moraca valley and was found in different crenal habitats from karst spring outlets to small forest brooks. *Brachyptera tristis* is a Balkan endemic species, restricted mostly to the Dinaric ranges and found exclusively in huge karst springs at low to moderate elevations. *Leuctra jahorinensis* and *Leutra malcor* are narrow endemics of the Dinaric Mountains, both restricted to mountain crenal habitats. *Protonemura auberti* and *Protonemura aestiva* belong to a Central European and Balkan species complex of crenal taxa. In the Balkans, they seem to be connected to karst springs. *Nemoura asceta* is a widespread Balkan endemic species, connected to small, temporary spring brooks of low to high elevations. *Isoperla pesici* is a widely distributed crenal species of the Central Balkans, which occurs in both small and large springs at different elevations. Water beetles (Coleoptera) are relatively common in the surrounding streams of the Lake, especially the Elmidae and Hydraenidae families that are also represented with endemic forms, such as *Ochthebius insidiosus* (Hydraenidae) described from Rijeka Crnojevića. However, the endemic status of some of their species has been considered as questionable.

Among the insects, dragon flies (Odonata) are among the groups, for which the threatened status in international scale has been assessed. Table 5.4 below represents the list of the dragonfly species from the Shkoder Lake basin that are threatened at the European and Mediterranean level[10], referring to the EU Habitat Directive, the Red List of the Mediterranean basin, the European Red List and the Bern Convention.

Table 5.4_List of dragonfly species (Odonota) from the Shkoder Lake basin that are threatened at the European and Mediterranean level

Species	EU Habitats Directive, Annexes	Red List of the Mediterranean basin	European Red List	Bern Annexes
Lestes macrostiogma		NT	VU	
Calopteryx splendens		VU	LC	
Coenagrion ornatum	II	NT	NT	
Coenagrion pulchellum		NT		
Erythromma najas		NT		
Brachytron pratense		NT		
Caliaeschna microstigma		NT	NT	
Gomphus flavipes	IV	NT	LC	II
Gomphus pulchellus		LC	LC	
Gomphus schneiderii		LC	NT	
Lindenia tetraphylla	II, IV	NT	VU	II
Cordulegaster bidentata		NT	NT	

[10] Source: Boudout & Kalkman, 2015

Species	EU Habitats Directive, Annexes	Red List of the Mediterranean basin	European Red List	Bern Annexes
Cordulegaster heros	II, IV	VU	NT	
Sympetrum vulgatum		NT		

Table above shows that all the listed 14 Odonata species, are threatened at Mediterranean level and 10 of them at European level. 4 species belong to the EU Habitats Directive and 2 species to Bern Convention.

Fish are represented with a relatively high rate of endemism at the catchment level and a low rate of endemism at the level of Lake basin (for lacustrine species). Seven fish species are endemic to the Lake catchment: *Ninnigobius montenegrensis, Knipowitschia montenegrina, Barbatula zetensis, Rutilus albus, Gobio skadarensis, Salmo zetensis* and *Chondrostoma scodrense*. The last one has been considered as en extinct species from the Lake already (Maric, 2018). Although all the endemic species have a conservation status in the Shkoder Lake, they are seriously threatened by most of the impacts occurring in the Lake, including bycatch.

From 59 fish species reported from Shkoder Lake catchment, 44 have a threatened status, of which, 14 species are of high conservation concern: 1 has been considered as extinct species (*Chondrostoma scodrense*), 2 species as extinct in the wild (the sturgeons *Acipenser naccarii* and *Acipenser sturio*), 3 species as Critically endangered (*Salmo marmoratus, Salmo zetensis, Pelasgus minutus*), 4 species as endangered (*Anguilla anguilla, Gobio skadarensis, Rutilus albus, Cobitis ohridana*) and 4 species as vulnerable (*Alosa fallax, Salmo farioides, Chondrostoma ohridanum, Cyprinus carpio*).

Many fish species, including endemic, rare and threatened ones, are endangered in the Shkoder Lake catchment because, besides other impacts, they are fished regularly as catch or bycatch, such as *Alburnus scoranza, Alosa agone, Salmo (all species), Squalius platyceps, Scardinius knezevici, Pachychilon pictum, Cyprinus carpio, Alburnoides ohridanus, Dicentrarchus labrax, Platichthys flesus, Chondrostoma nasus, Mugil cephalus, Liza ramada* etc.

Amphibians. From 15 amphibian species reported from Shkoder Lake catchment, four of them (*Triturus macedonicus, Pelophylax kurtmuelleri, Pelophylax shqiperica* and *Rana graeca*) are endemic to the entire or southeastern part of the Balkan Peninsula. All reported species are threatened at European level, after the IUCN Red List (14 species have the LC status, whereas one species, *Pelophylax shqiperica,* has the EN status). All species are included in the Bern Convention (Annex II and Annex III), and 9 species are included in the EU Habitat Directive (Annex II, Annex IV and Annex V).

Reptilians are represented with 36 species in Shkoder Lake catchment area. The Prokletije rock lizard *Dinarolacerta montenegrina* must be a conservation priority in the region, because of its endemic status (after Crnobrnja-Isailovic, 2018). All species have a threatened status in the Lake catchment area, where 2 species, *Dinarolacerta mosorensis* and *Vipera ursinii*, have been considered as vulnerable. Four species are included in the IUCN Red List at Global Level: *Emys orbicularis* (status NT), *Mauremys rivulata,* (status LC), *Natrix natrix* (status LC) and *Natrix tessellata* (status LC). 2 species are included in the CITES Convention (Annex I and Annex II), all species are included in the Bern Convention (Annex II and Annex III), and 28 species are included in the EU Habitat Directive (Annex II and Annex IV) – see Table 4.2.6 for more details.

Mammals. It is worthy to note the presence of species included in the the IUCN Red List at Global Level, such as the brown bear *(Ursus arctos)*, the grey wolf *(Canis lupus)*, the red fox (Vulpes vulpes), the pine marten (Martes martes), the beech marten (Martes foina), the least weasel

(Mustela nivalis), the western polecat (Mustela putorius), the Eurasian otter *(Lutra lutra),* the Eurasian lynx *(Lynx lynx)*, the wild boar (Sus scrofa), the European roe deer *(Capreolus capreolus)* and the northern chamois *(Rupicapra rupicapra)*. Several species of small bats (Microchiroptera) are also included in the the IUCN Red List at Global Level. Although most of these globally threatened species have a low conservation status (most of them LC), their presence in the Shkoder Lake watershed is important for highlighting the need for conservation of the Lake, its watershed and its mammal fauna in regional, European and global levels. Many reported species of mammals are threatened at European level. 3 species are included in the CITES Convention (Annex I and Annex II), 27 species are included in the Bern Convention (Annex II and Annex III), and 20 species are included in the EU Habitat Directive (Annex II and Annex IV) – see Table 4.2.6 for more details.

Birds represent one of the groups with the highest number of threatened species in the Shkoder Lake watershed. From 282 bird species reported in this area, 157 species (55% of the total) are included in the EU Directive on Birds (2009/147/EC), while 168 species (59% of the total) have a threatened status after the IUCN Red List at European level. Number of species for each threatened category is in the following:

Four birds species have a high threatened status, of which, 2 are vulnerable (VU): *Aquila clanga, Aythya ferina*; and 2 others are endangered (EN) *Melanitta fusca, Oxyura leucocephala*. Historically, Shkoder Lake has been considered as one of the most important wetlands for wintering of aquatic birds (waterfowl) in Europe. Referring to long-term bird census, the maximal number of individuals during winter in Shkoder Lake and its surrounding wetlands (in Albania and Montenegro) has varied from 200.000 to 400.000. However, this number has declined during the two last decades, as well as the species number. During some recent years the species number of wintering birds has declined up to 40. The Common Coot (*Fulica atra*) has usually been the species with the highest population density in the lake, counting more than 50% of the wintering birds in the whole lake. Other species with high population density in the lake are *Phalacrocorax carbo, Microcarbo pygmaeus, Aythya ferina, Croicocephalus ridibundus, Anas platyrhynchos, Podiceps nigricollis, Podiceps cristatus* and *Tachybaptus ruficollis*.

Being a protected area and, furthermore, a Ramsar site (Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat), the whole Shkoder Lake and its surrounding wetlands must be treated as a habitat of special conservation concern for ornithofauna.

5.3.3.4 Habitats of Conservation Concern

According to the Managing Plan of Shkoder Lake NMR[11], Shkoder Lake watershed is characterized by a relatively high number of natural habitats that deserve special conservation measures. With reference to the EU Habitat Directive (Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora), amongst the natural habitats are included also also two Priority Habitat Types (in danger of disappearance), namely the Habitat 6220 "Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea" and the Habitat 91AA "Eastern white oak woods".

[11] APAWA, FSHN-USH, GR Albania. The Management Plan for Shkoder Lake NMR. LSIEMP, World Bank, Ministry of Environment (2012). 111 p.

5.3.4 Main Findings, Gaps and Suggestions

5.3.4.1 Main findings

- The wide Project area is characterized by endemic, rare and threatened species of plants (aquatic and terrestrial), fish, birds and invertebrates. Several species are threatened at global, European, Mediterranean and national levels, referring to the IUCN Red List, Bern Convention, CITES Convention, EU Habitats Directive and EU Birds Directive.
- The Project area is characterized by important aquatic and terrestrial habitats, of special conservation concern, according to *EU Habitats Directive*, including Natura 2000 habitat

5.3.4.2 Main Gaps

- Despite the increased intensity of studies, surveys and assessments of Shkoder Lake, its biodiversity, ecological and environmental state during the last 20 years, there is still poor knowledge of some biotic groups.
- Often, it is difficult to reach a full data elaboration and concluding with a full list of species and habitats, as well as assessment of their threatened status and environmental state, because the different studies and publications refer to different study areas, some of them referring separately to: 1) Lake Shkoder only; or 2) Lake Shkoder with the surrounding wetland areas; or 3) Lake Shkoder and its tributaries (rivers), or 4) the whole lake watershed area, up to 1900 m a.s.l. Many surveys and assessments have been done separately for the Albanian part and for the Montenegrin part of the Lake; protection status of the lake is different between the two countries (National Park in Montenegro; Nature Managed Reserve in Albania). A lot of data on species presence and ecological state has often been mentioned in general for the Lake, or for its watershed, without referring to a specific site and period, where and when the data have been provided.

5.3.5 References

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5.4 Appendix 5.4: Description of soil groups and subgroups

According to the World Reference Base for Soil Resources (WRB), the types of soil that are present alongside the railway line the groups of Fluvisols and Cambisols and the subgroups of Vertisols, Arenosols, Gleysols, Luvisols, Phaeozems and Regosols.

Hereinafter follows a short description of each of them.

Fluvisols are found in alluvial deposits that cover alluvial plains, rivers' sides and tidal marshes. They are charecterized by a weak or nonexistent uppermost layer, and by parent material that is formed by river, lake, or marine sediments that have been recently deposited. Fluvisoils have a stratified profile that reflects their depositional history or an irregular layering of humus and mineral sediments in which the content of organic carbon decreases with depth. They are young and therefore show little horizon differentiation. Chemically, Theit pH is almost have a nearly neutral, while the salinity and sodium content show high levels, overall within the coastal areas. Physically they are mostly wet, due to stagnating groundwater or floodwater. Humus content ranges from 0.62-3.6%, N-total from 0.063-0.21%, Phosphorus (P_2O_5) from 1.08-18.72 ppm and Potassium (K_2O) 3.5-31.6mg/100 gr of soil.

Cambisol is a soil with a beginning of soil formation, while the horizon differentiation is weak. This is evident from the weak, mostly brownish discoloration and/or structure formation in the soil profile. Cambisols are developed on medium and fine-textured materials that are formed by a wide range of rocks, mostly in alluvial, colluvial and aeolian deposits. Most of these soils form good agricultural land and are intensively used. Regarding their properties, most Cambisols contain minerals in the silt and sand fractions. They occur in regions with a precipitation surplus but in terrain positions that allow surface discharge of excess water. Cambisols are medium textured and have good structural stability, high porosity, and good water holding capacity and good internal drainage. In most cases, Cambisols have a neutral to weakly acid soil reaction, a satisfactory chemical fertility and an active soil fauna.

Fluvisols and cambisols are distinguished geographically in six subgroups, as follows[12]:

- Vertisols are deep clayey soils (>30 % clay) dominated by clay minerals such as smectite that expands upon wetting and shrinks upon drying. They form large cracks down to 50 cm from the soil surface when drying out. The upper part of the soil consists of strong and prism-like blocks. Regarding their properties, Vertisols become very hard and develop deep and wide cracks during the dry season. During the rainy season the cracks disappear while the land becomes fairly inaccessible due to a very slippery surface. They become sticky and plastic (often untrafficable) when wet. The most important physical characteristics of Vertisols are the low hydraulic conductivity and stickiness when they are wet and a high flow of water through the cracks when they are dry. They become very hard when dry. Vertisols are relatively rich chemically, having a large reserve of weatherable minerals. The pH is neutral or slightly alkaline in most cases, while base saturation is usually high, since many Vertisols show accumulation of lime.

- Arenosols are of sandy nature, which dominates their characteristics and properties. Their texture is loamy sand, and therefore they are very permeable and have rapid infiltration, high hydraulic conductivity and low water holding capacity. Chemically there may be quite large variations in contents of organic matter and nutrients. The pH and base saturation are very variable.

- Gleysols or soils with gleyic properties are permanently wet and reduced at shallow depth. The upper part of the soil is therefore either mottled (in case of temporary aeration) or has colors reflecting reduction. Gleyic properties are formed when the soil is completely saturated with groundwater, unless drained, for a period that allows reducing conditions to occur. This period may range from a few days in the tropics to a few weeks in other areas. Chemically Gleysols are better than the surrounding uplands, due to the fact that they normally have a finer soil texture, slower organic matter decomposition and enjoy an influx from ions from adjacent (higher) lands. Physically, Gleysols are saturated with water for long periods during the year. Repeated wetting and drying may also cause soil densification due to the weakening of interparticle bonds during saturation and contraction of soil particles upon desaturation.

[12] Zdruli et al. "Land Information System of the Republic of Albania" (Interreg II Italy-Albania Project, Tirana, 2001)

- Luvisols are usually well drained. In case of a compacted argic horizon, internal permeability may be low so that water stagnation in the upper layers occurs. Water holding capacity in the argic horizon is high and ranges between 15 to 25 volume %. Luvisols in loess regions have a high silt content and are vulnerable to soil erosion. The moderate to high cation exchange capacity indicates the presence of high activity clays. Low aluminium saturation reflects a limited leaching, a fair content of plant nutrients, a medium pH and a good level of fertility. The rather favorable physical and chemical fertility status results in a relatively high status of biological activity in Luvisols, especially where fertility has been upgraded through long standing applications of organic and mineral fertilizers.

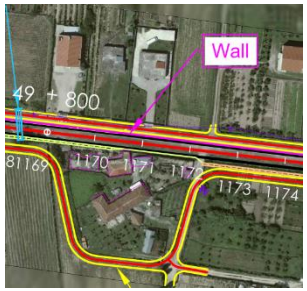
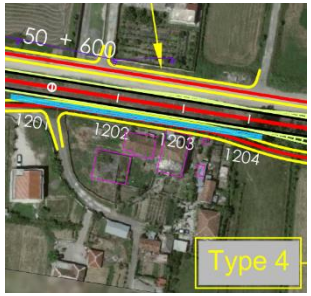
- Phaeozems are typical soils of the wetter and warmer steppe (prairie) regions. They occur in more humid environments than the other steppe soils. Consequently biomass production is higher but also weathering and leaching is more pronounced in these soils. The topsoils of Phaeozems are usually thinner than those of Chernozems and perhaps somewhat less dark. Phaeozems are porous, well-aerated soils with stable structures, relatively rich in nutrients and make excellent farmland. Many Phaeozems show a clay accumulation in the subsoil, which increases its water holding capacity. Yet Phaeozems still may be short of water in the dry season.

- Regosols are the initial state for pedogenesis representing recently deposited, or recently exposed, earthy materials at the earth surface. The central concept of a Regosol is a deep, well-drained, medium textured, non-differentiated mineral soil that has a minimal expression of diagnostic horizons, properties or materials other than an ochric horizon. Most properties of Regosols are associated with the materials themselves and the climate, not with genetically developed soil features. Chemically, Regosols may have a high or a low base status. A thin poorly decomposed humus layer occurs in cold climates, while organic matter content is low in hot and dry climates.

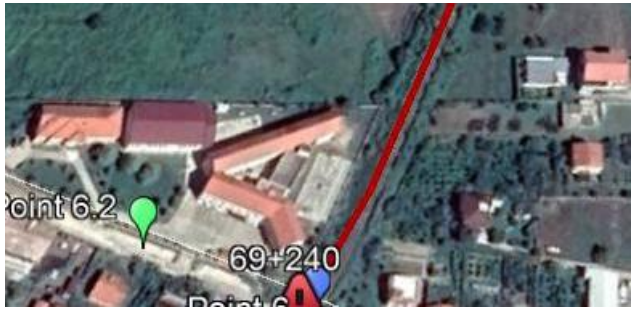
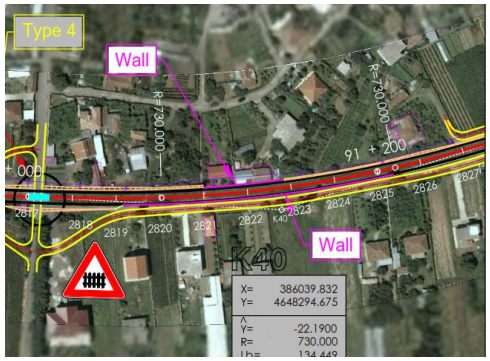
6 Appendices related to chapter 6

6.1 Appendix 6.1: Location of the eventual noise protection works

Table 6.1_Sections to be studied for any eventual installation of future noise barriers

No	Railway line section		Barrier location	Comment / suggestions on the proposed noise barriers	
	Start (km)	End (km)	East/West of the line		
1	49+800	49+880	East	Agricultural area in the west of Lac town; Farmhouses; Suggestion: a-Avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution	
2	50+620	50+670	East	Agricultural area in the west of Lac town; Farmhouses; Suggestion: a-Avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution	
3	51+970	52+030	West	Agricultural area in the west of Lac town; Two farmhouses; Suggestion: a-Avoid sound waves refraction; b-Insulating barrier is the preferred solution	

No	Railway line section		Barrier location	Comment / suggestions on the proposed noise barriers	
4	66+930	67+470	West	Western neighbouring of Lezhe town; Low buildings (houses); Suggestion: a-Avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution; c-Transparent barrier is preferred	
5	67+550	67+700	East	Lezhe town neighbouring; Low buildings (houses); Suggestion: a-Avoid sound waves refraction; b-Insulating barrier is the preferred solution; c-Transparent barrier is	
6	68+680	68+800	Both sides	Lezhe town neighbouring; Low buildings; Suggestion: a-Avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution; c-Transparent barrier is	

No	Railway line section		Barrier location	Comment / suggestions on the proposed noise barriers	
7	69+250	69+350	West	Lezhe town neighbouring; 9 years – school "At Shtjefen Gjecovi"; Suggestion: a-Avoid sound waves refraction; b-Insulating barrier is the preferred solution	
8	90+800	90+925	West	Kac Village: Farmhouses on the west and agricultural land on the east; Suggestion: a-Avoid sound waves refraction; b-Insulating barrier is the preferred solution	
9	91+000	92+250	Both sides	Kac Village: Farmhouses; Suggestion: a-avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution; c-Transparent barrier is preferred	

No	Railway line section		Barrier location	Comment / suggestions on the proposed noise barriers	
10	103 +120	105+050	Both sides	Eastern neighbouring of Shkoder City; Mostly houses; Suggestion: a-Avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution; c-Transparent barrier is preferred to allow the view of Kiri River	
11	105+850	106+550	Both sides	Shkoder town, eastern neighbouring; Houses; Kiri River runs on the east;Suggestion: a-Avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution; c-Transparent barrier is preferred to allow the view of Kiri River	
12	106+680	107+200	West	Shkoder town, eastern neighbouring; Houses; Kiri Rive borders from the east the railway line. Suggestion: a-avoid sound waves refraction and reflection; b-Insulating barrier is the preferred solution; c-Transparent barrier is	

No	Railway line section		Barrier location	Comment / suggestions on the proposed noise barriers	
				preferred to allow the view of Kiri River	
13	107+400	107+500	East	Shkoder town, north-eastern neighbouring; Low buildings on the east; Agricultural land on the west; Suggestion: a-avoid sound waves refraction; b-Insulating barrier is the preferred solution	
14	113+220	113+500	West	Grile Village: Low buildings and a church on the west. Agricultural land on the east. A wall is planned to be built; Suggestion: a-the wall should avoid sound waves refraction; b- insulating wall is preferred; c-whether possible use transparent material in front of the church to not block its view