FEDERATION OF BOSNIA AND HERZEGOVINA ROAD SECTOR MODERNIZATION PROJECT

Environmental and Social Impact Assessment for the Section Neum-Stolac

Non-Technical Summary

JP CESTE FEDERACIJE BIH
Javno preduzece Ceste Federacije Bosne i Hercegovine

March 2016.

UPDATED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
FOR SECTION NEUM – STOLAC

NON-TECHNICAL SUMMARY

CLIENT:

Public Company Roads of FBH
Terezija 54, 71 000 Sarajevo
Tel/fax: +387 33 250-370; 250-400
web site: www.jpcfbih.ba

CONSULTANT:

Ecoplan Ltd. Mostar
Dr. Ante Starčevića, b.b. 88 000 Mostar
Tel/fax: +387 36 397-400; 397-410
e-mail: ecoplan@ecoplan.ba
web site: www.ecoplan.ba

EXPERT TEAM:

Borislav Puljić, Ph.D., graduate architect
Danijela Mandić, graduate civil engineer
Mirela Šetka Prlić, graduate civil engineer
Draženka Puljić, graduate economist
Berislav Crnjac, graduate civil engineer
Ivan Antunović, Ma. in geology engineering
Anđelka Vojvodić, graduate civil engineer
Marija Rakić, graduate architecture engineer
Monika Kordić, Ma. civil engineer
Sanja Bekavac, Ma. civil engineer
Renata Pehar, graduate economist
Marko Puljić, Bac. economist
Lana Puljić, Ma. Economist
Prof. Murat Prašo, Ph.D., graduate economist

PROJECT NO.: **367/15**

CONTRACT NO.: **I – 441 – 367/15**

CEO„Ecoplan“ Ltd. MOSTAR Borislav Puljić, Ph.D., graduate architect

_____

Mostar, March 2016

CONTENTS:

LIST OF IMAGES IN THE DOCUMENT

LIST OF TABLES IN THE DOCUMENT

ABBREVIATIONS

AADT – annual average daily traffic
BH – Bosnia and Herzegovina
EIS – Environmental Impact Study
EISA – Environmental and Social Impact Assessment
F BH – Federation of Bosnia and Herzegovina
FMoET – Federal Ministry of Environment and Tourism
Ha – hectar
PAP – Project affected persons
PC Roads FBH – Public Company Roads of Federation of Bosnia and Herzegovina
PEIS - Preliminary Environmental Impact Study
PPM Neum – Physical plan of the Municipality of Neum
PPM Stolac – Physical plan of the Municipality of Stolac
RAP – Resettlement Action Plan
RPF – Resettlement Policy Framework
WB – World Bank

1. INTRODUCTION

Public Company Roads of the Federation of Bosnia and Herzegovina (PC Roads FBH) has launched the Modernisation of major roads in the FBH Programme for modernisation of major roads in the Federation of BH to assure adequate road infrastructure by 2020. In the framework of the abovementioned umbrella Programme, the PC Roads of FBH has initiated the FBH Road Sector Modernization Project (the Project). FBH applied for loans from the European Investment Bank (EIB) and from the World Bank (WB) in the total amount of 103, 38 million EUR for funding the Project. The Project comprises several small and mid-sized investment schemes, including road rehabilitation and upgrade, road safety interventions, institutional strengthening and implementation support. The interventions of the Programme will follow the guidelines on environmental and social due diligence as set forth in a separate Environmental and Social Management Framework (ESMF) as some of the sections remain unknown at the time of the formal project Appraisal. This summary document presents the major findings of the Environmental and Social Impact Assessment (ESIA) of the proposed new road leading from Neum to Stolac, the M17.3 road.

The proposed construction of the new road M17.3 Buna-Neum, section Neum-Stolac has a total length of 38,3 km and islocated in Herzegovina-Neretva County. Given the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental and social impacts, the project was classified as a Category A project. The present study is being carried out to review and update the earlier Environmental Impact Study (EIS) carried out for the same section (Neum – Stolac) in 2009 with the aim to include and evaluate social impacts as well, and to reflect the status on the ground as of 2015. This Environmental and Social Impact Assessment (ESIA) is in compliance with the Environmental Protection Act of the Federation of Bosnia and Herzegovina (Official Gazette of the FBH, no. 33/03 and 38/09) and the World Bank Operational Policies (OP).

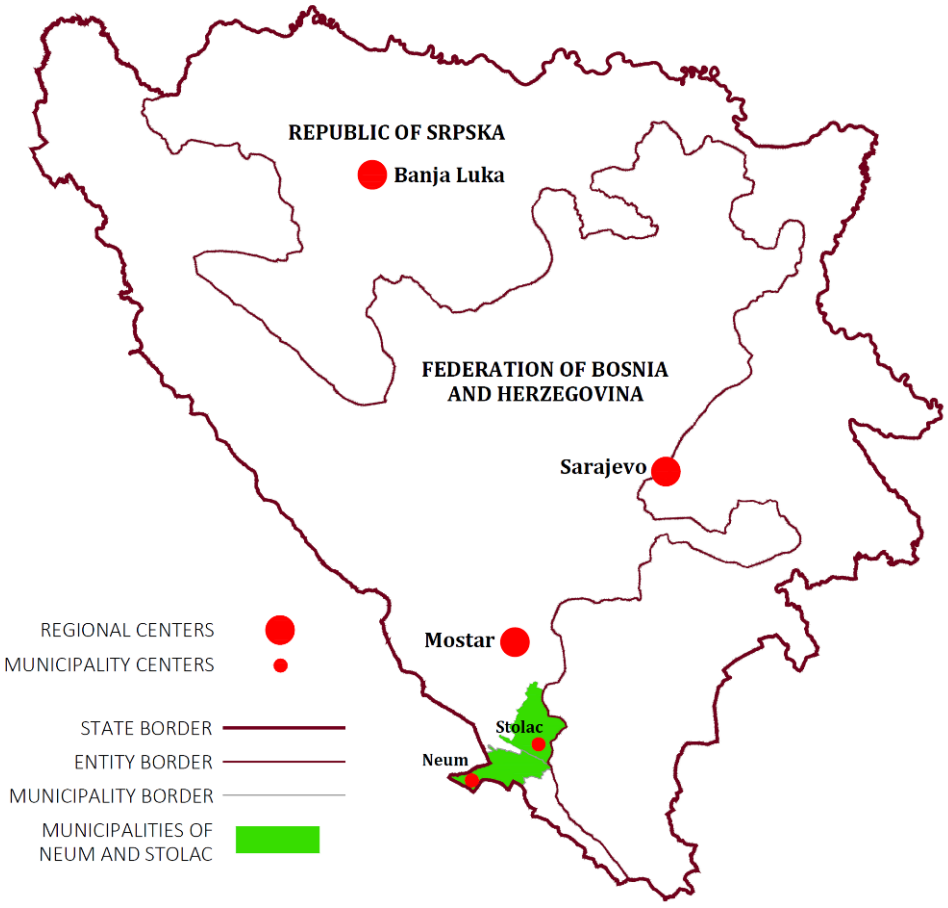
The purpose of the ESIA report is to evaluate the project's potential environmental and social risks and impacts in its area of influence; examine project alternatives; identify ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental and social impacts and enhance positive impacts; and includes the process of mitigating and managing adverse environmental and social impacts throughout project implementation. Wherever feasible preventive measures are proposed over mitigation or compensation..

This non-technical summary report represents part of documentation produced for Neum-Stolac ESIA Contract, and the overall Contract includes: Updated Environment and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Waste Management Plan (WMP), and Non-Technical Summary (NTS) for ESIA.The non-technical summary provides summarised project description, environmental and social aspects of the influenced area and summarises the results obtained by producing the documentation as mentioned earlier.Detailed information on complete documentation can be obtained in PC Roads of FBH in Sarajevo.

1.1. PROJECT LOCATION

Section Neum-Stolac is situated in Federation of Bosnia and Herzegovina, Herzegovina-Neretva Canton, more precisely in Municipalities of Neum and Stolac, as shown in image below.

Image 1. Position of Municipalities of Neum and Stolac in FBH



source: Ecoplan

Section Neum-Stolac is a part of the major road M17.3 Buna-Neum, which is a branch of the major road M17 Sarajevo-Mostar-Čapljina-Metković, the latter in the Republic of Croatia, that connects north of Bosnia and Herzegovina with the country's south in the total length of 433 km. In addition to the current road network, the road shall be connected with the future expressway - corridor Vc. Corridor Vc is currently in different stages of construction, i.e. the southern part Zvirovići (Čapljina Municipality)-Bijača (south-west border with the Republic of Croatia in Ljubuški Municipality) is constructed and utilized, while other areas of this corridor in Herzegovina Neretva Canton are still in the project design stage. The nearest connection of the new road M17.3 with the corridor Vc is designed at the intersection Mostar south, as shown in the image below.

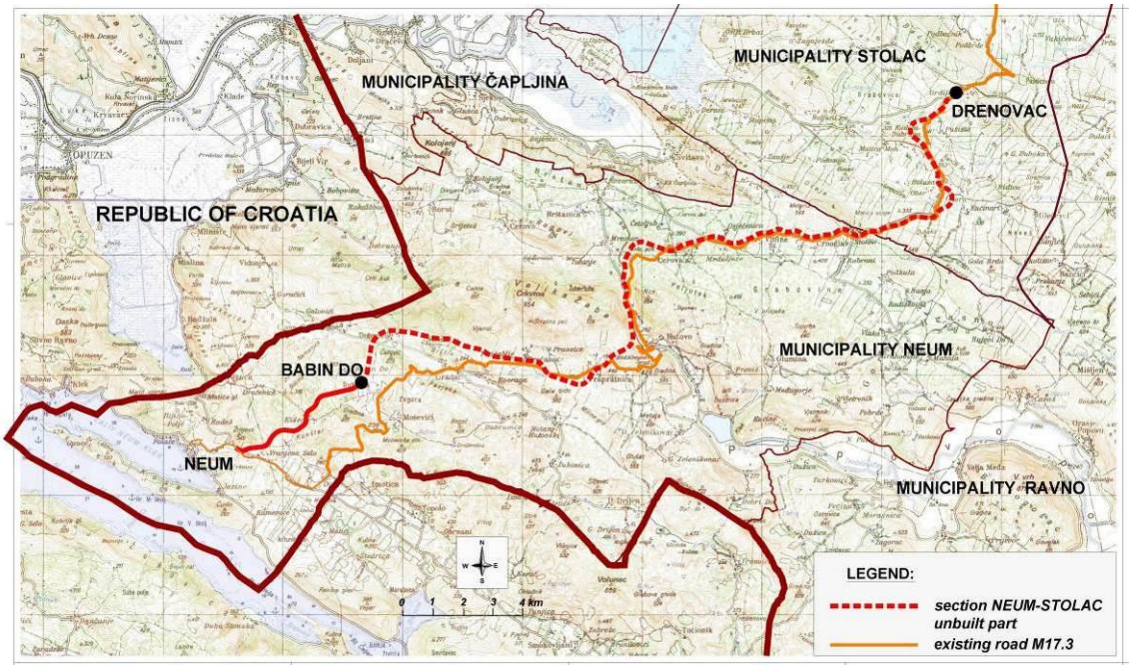
Image 2. Position of road Neum-Stolac

source: Ecoplan

The M17.3 begins at the settlement Buna, situated 11 km south from the City of Mostar, the regional centre of Herzegovina. From Mostar, the road continues to the South-East through the City of Stolac towards the coast, resp. to the City of Neum.

The map below shows position of the planned road in regard to existing M17.3.

Image 3. Position of the planned road in regard to the existing M17.3



source: Ecoplan

1.2. PROJECT RATIONALE

The existing road Buna-Neum M 17.3 is presently the only connection that Bosnia and Herzegovina has with the Adriatic Sea. Currently the Neum-Stolac road is in such poor condition that the majority of traffic to the coast is realised through the territory of the Republic of Croatia, assuming two border crossings. After Croatia had joined the European Union (2013), some of the traffic moved to the BH territory in particular for transport of goods that either cannot enter the EU or would need additional control and paperwork.

The existing Neum-Stolac road has below-standard technical conditions for a major road and its importance in the regional transport network. Modest technical elements include minimum radius, total width of 3-4 m, longitudinal inclinations higher than 7%, blind curves, high number of serpentines, etc. Additionally, the existing road suffered substantial damages during the last war (1992-1995) which adds to its low safety profile. In the period 2009 – 2013, 104 traffic accidents were recorded in this section, of which two were fatal. Although the road was reconstructed, section Burmazi – Hutovo is still in poor technical condition, as the road narrows down to 3 m. Section Hutovo - Duži has a slightly favourable profile with the width of the roadway of 4 m and better technical elements. From Duži to Neum the roadway width is 6 - 7 m and can be considered as satisfactory.

For Bosnia and Herzegovina, the realisation of the Neum-Stolac road would have multiple advantages. The construction of the road would enable BH access to the Adriatic Sea over its territory, connecting the interior of the country with its only

maritime city and tourist centre - Neum. Besides that, with the construction of M17.3, the M-17 (Mostar-Doljani, i.e. border with the Republic of Croatia) would be significantly disburdened, reducing the traffic jam and standstills at the border crossing with the Republic of Croatia.

1.3. PROJECT BACKGROUND

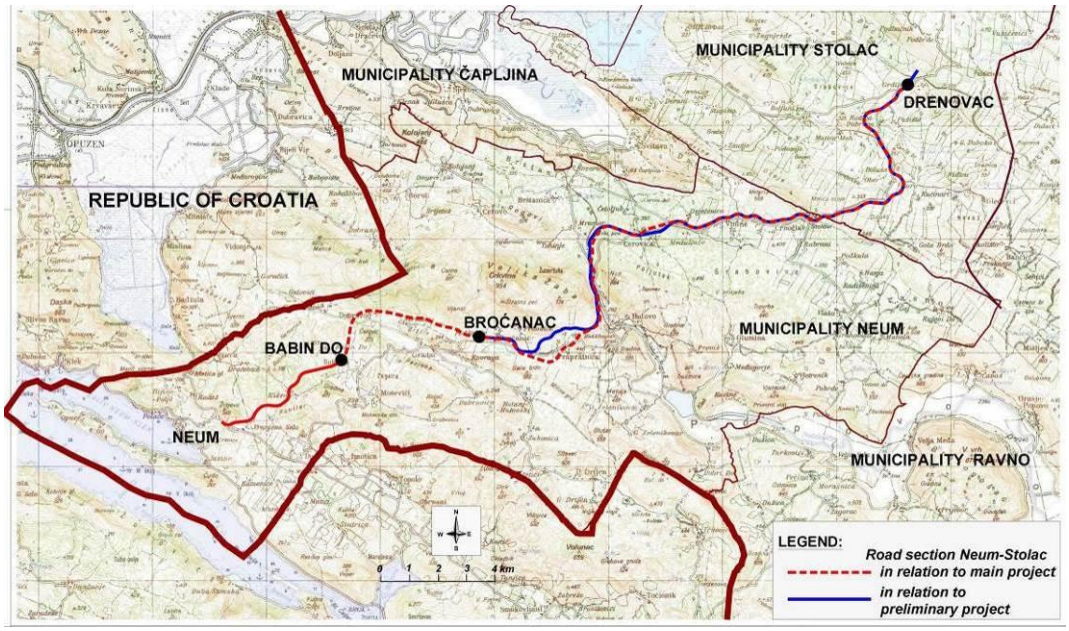
Regarding the significance and importance of the Neum-Stolac road for Bosnia and Herzegovina, its construction was initiated in 2010. This road is included in the Physical plan of the Federation of Bosnia and Herzegovina, which is still being drafted, and in the physical plans of the Municipalities of Neum and Stolac. The Physical plan of Neum Municipality was completed in October 2015, while the Physical plan of Stolac Municipality is still being drafted.

Following local legislation, a Preliminary Environmental Impact Assessment (PEIA) was prepared for the road. Based on the Decision on the preparation of the EIA, ref. UPI/05-23-77/09 of 8 June 2009, issued by the Federal Ministry of Environment and Tourism (FMoET) final Environmental Impact Assessment (EIA) was prepared in 2009. As part of the environmental impact assessment and according to the Environmental Act of FBH, the Prior Water Consent was also issued, ref. UP-I/40-1/25-2-56/10.

Based on the 2009 EIA, the construction of the road M17.3 Buna-Neum, section Neum-Stolac, was adopted by the FMoET. The EIS provided the basis for the 2010 issuance of the environmental permit for the road M17.3, Neum-Stolac section. The validity term of the environmental permit is five years, and the extension of the permit is in process.

In the period 2010 – 2015, the first 5,3 km of the new road (Stari-Neum to Babin Do) were constructed. Also, in 2013 the road alignment was adjusted several times to reflect the priorities of local communities. Most notably, a major alteration to the design was made by the Municipality of Neum proposing a tunnel near Hutovo settlement, thus significantly increasing the cost of the project. Other adjustments involve by-passing olive groves along thes ection Babin Do-Broćanac, including crossroads for the community Papratnica, and avoiding the shrine in Hrasno. Image 3. shows the difference in road alignment between main and preliminary project design.

Image 4. Position of the road in relation to the preliminary and main design



source: Ecoplan

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK ANALYSIS

2.1. WORLD BANK SAFEGUARDS POLICIES

The objective of the World Bank's environmental and social safeguard policies is to prevent and mitigate harm to people and their environment in the development process.

The policies help ensure the environmental and social soundness and sustainability of investment projects. The Policies Promote environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions, physical cultural resources. It is also intended to avoid or minimize involuntary resettlement and, where this is not feasible, assist displaced persons in improving or, at least, restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing before the beginning of project implementation, whichever is higher.

Operational policies that are relevant to the project of construction of the major road are OP 4.01 Environmental Assessment (EA), OP 4.04 Natural habitats, 4.11 Physical cultural resources and OP 4.12 Involuntary Resettlement.

The Project of Construction of the major road M17.3 is classified as A category according to the categorization by the World Bank. In light of that fact, this project that is likely to have significant adverse environmental impacts, which may affect area broader than the sites or facilities subject to physical works.

2.2. NATIONAL AND LOCAL LEGISLATIVE

The most important and fundamental environmental act in FBH is the Environmental Protection Act (Official Gazette of the FBH no. 33/03 and 38/09) which regulates environmental protection and its legal framework. Other relevant acts regulating environment in FBH are The Nature Protection Act *(Official Gazette of the FBH, no. 66/13)*, The Waste Management Act *(Official Gazette of the FBH, no. 33/03 and 72/09)*, The Water Act (*Official Gazette of the FBH, no. 70/06)*, The Act on Physical Planning and Use of Land *(Official Gazette of the FBH, no. 2/06, 72/07, 32/08, 4/10, 13/10 and 45/10)*. In addition to that, BH is signatory to numerous and significant international contracts, conventions and protocols referring to the environment and its protection.

Environmental protection is under jurisdiction of the FBH and cantons. The Federal Ministry of Environment and Tourism (FMET) is in charge of environment management at the level of entities with all authorities and jurisdictions. FMET performs administrative, expert and other jobs from the competence of the FBH relating to the ecological protection of air, water and soil; creation of environmental protection strategy and policy; quality standards of air, water and soil; ecological monitoring and control of air, water and soil. The Cantonal ministries are in charge of environment

management in 10 cantons of the Federation responsible for the environment at Cantonal level.

An important role in the environmental protection in the FBH have Federal Ministry of physical Planning (FMPP), Federal Ministry of Agriculture, Water management and Forestry (FMAWF) and Agency for Adriatic Sea Watershed. Agency is in charge of issuing water permits, water quality monitoring, and creating plans for water management, protection of water and from the water.

The environmental permit in the FBH is also issued on a cantonal level, as regulated by cantonal acts on the environmental protection and Rulebook[1], which defines, unlike the federal procedure, the list of interventions for which the permit is issued. On the cantonal level an application is filed for issuing the environmental permit, by which the permit is then issued.

In accordance with Article 56 of the Environmental Protection Act (*Official Gazette of the FBH,33/03* and *39/09*), a separate Regulation will determine which facilities are obliged to Environmental assessment.

According to the FBH Regulation and cantonal regulations, Environmental Impact Assessment for the Project of constructing major road is required as well as obtaining an environmental permit.

2.3. DIFFERENCES BETWEEN THE WB OPERATIONAL POLICIES AND FBH LEGISLATION

The environmental laws of the FBH provide an adequate framework to integrate environmental provisions and measures that are in general compatible with WB requirements. The process of environmental impact assessment in the FBH is based on the environmental permit, which is in turn a requirement for other necessary permits (such as the urban consent). The steps required for obtaining an environmental permit are laid during both categorization and screening. It is anticipated that the requirements of the WB with regards to specific components of the EA process can be easily incorporated into the overall FBH EIA process.

The difference between these two processes is that the FBH legislation considers that the EIA process results in issuing of permits: Environmental permit, Urban/Location permit, Construction and Use permit for construction of new facilities or reconstruction of existing ones. The environmental permit is reissued every 5 years. One of the major shortcomings of the EIS or EIA produced to meet the local legal requirements is the lack of a detailed social assessment and inclusion of social data and indicators in the EIA report itself. As such, this was one of the main reasons why the EIS prepared in 2009 needed to be revised in the form of this ESIA.

[1] Regulation on plants and facilities for which the environmental impact assessment is required and plants that can be built and used only with the environmental permit. (Official gazzette FBiH no.19/10)

The key difference between the content and requirements of the ESIA as per the World Bank policies and the Environmental Impact Assessment for the environmental permit is reflected in the monitoring of different parameters, in particular the environmental baseline. Since the environmental permit is issued per laws of FBIH as part of the process for issuing the construction permit, majority of baseline indicators and project impacts are determined to be monitored in the environmental permit, while the EIA proposes the parameters to be monitored. As such, a number of monitoring requirements, as set forth in this ESIA are also determined to be the responsibility of the contractor and to be carried out shortly prior to the start of works.

In order to fully meet the requirements of the World Bank's Operational Policies, as set forth for a Category A project, a detailed and site-specific Environmental and Social Management Plan (ESMP) will need to be prepared prior to the start of works, while the ESMP, with all of the obligations set forth are included in the Bidding documents for works. The site specific ESMP will build on the requirements of the environmental permit, recommendations of this ESIA and shall include monitoring results that would establish the environmental baseline for the project site, including detailed biological and archaeological surveys, and all other site specific information and details that are determined in this ESIA to be carried out prior to start of works. This is stipulated in the Loan Agreement for the project, and is one of the conditions that need to be met prior to the start of works.

3. DESCRIPTION OF THE PROJECT

The proposed new road begins at the settlement Babin Do (Municipality of Neum), and ends in the community Drenovac (Municipality of Stolac).

The section Stari Neum- Babin Do (5.6 Km) is nearly completed with only the final asphalt layer remaining to be placed.

The three road sections remaining to be constructed are as follows:

- Section Babin Do – Broćanac, length 6.4 km;
- Section Broćanac – Hutovo – Cerovica, length 11.2 km;
- Section Cerovica – Drenovac, length 15.3 km.

Section Kiševo-Broćanac **-** The beginning of the first subsection is at the settlement Babin Do, and it continues to the constructed part of the road Stari Neum – Kiševo. Section crosses over nearly designed bridge under which the access road connects to the newly designed major road M17.3 with Babin Do settlement. Right before the road reaches the entrance of Oštrovac tunnel, it passes over a bridge 10 m long, passing over the local road that connects village Dobrovo and Oskrušnica. Also, the route goes through a tunnel 190 m long. For the needs of public transportation the planner intended bus stops that are placed and set according to the needs of the local

population. From tunnel Oštrovac, the road continues furthermore to the settlement Broćanac, where the first sub-section of the road finishes.

Section Broćanac-Hutovo-Cerovica – At the beginning of this section, an intersection is planned to be constructed in order to connect the existing major road (later to be used as a local road) and settlement Broćanac with the newly designed major road M17.3. The road then goes towards the south of hill Glavica and over the existing major road, where the underpass will be located. Then it stretches toward the existing major road and tangents settlement Prapratnica, which is connected with new major road by planned junction with the same name. Further, the road ascends towards Žaba hill, where the existing major road underpasses. The Žaba tunnel is 975 m long. This position of the road is conditioned by the position of the junction for Hutovo. The road goes nearby Cerovica and passes the existing local road where a construction of the underpass and a relocation of the local road is planned. There is also a possibility of construction of a new railway crossing at the level of the existing narrow gauge railway. Forth, the road proceeds to the two-direction Cerovica intersection, first connecting to the existing major road Neum-Stolac, and the other to the regional road R-426 Cerovica-Dračevo (Čapljina).

Section Cerovica-Drenovac – The beginning of this section begins immediately after the junction in Cerovica. The road in several places intersects with the local roads and the construction of underpasses is planned in order to enable undisturbed traffic. The junctions should connect settlements with newly designed major road M17.3.

At the starting point, the main road intersects with a local road to settlement Osječani, where building of an underpass is planned, and partial relocation of the local road. From settlement Crnoglav to Rabrani, and to nearby villages some local roads will be partially relocated, and in some cases junction and underpasses are planned for construction. The road then continues downhill to the settlements Udora, Ober and Doluša, the most precipitous part of the road. Here, a lane for slow vehicles is planned. The road then goes through the most populated area of the section, the densest network of the local road and a significant amount of cultivated areas. It is continuing in the direction of Drenovac and again intersects local roads, so partial relocation and construction of underpasses is planned. This section ends with the planned intersection Drenovac.

Project alternatives and implementation agreements

Different alternatives of connections of the Neum with the interior of BH were being explored back in the 1970es. For the purpose of developing Physical Plan of the Socialist Republic of BH for the period 1981-2000, several possible alternatives of this road were explored, and the most favorable one, the corridor of 3 km width was established. It was implemented into the Physical Plan of the Municipality of Neum (1985-2000) as the corridor for further research. Recently, for the purpose of creating the Physical Plan of the Federation of BH (development phase) and the Physical Plan of the Municipality of Neum (2010-2020) the established corridors were reconsidered, as well as several alternative routes within the corridors.

Five road connection alternatives between Brocanac and Hutovo were analysed in 2013, one of which was according to the preliminary design. The possibility to avoid construction of tunnel Žaba had significantly lower costs, but Municipaliy of Neum insisted on the alternative that includes tunnel construction, and it was chosen to reflect the priorities of the local community which where to improve road connectivity to the settlement Hutovo and lesser the road's visual impact on the landscape. Other changes involve by-passing olive groves along the section Babin Do-Broćanac, including the community intersection Papratnica. In addition to that, in the area of the Queen of Peace Shrine, a request by the local community was accepted to place the route further to the north because of unique characteristics of the terrain and access to the Shrine, which was accepted by the Investor and implemented into the final version.

4. PROJECT AREA OF INFLUENCE

The route of the section Stolac-Neum passes mostly through a rural area of Neum and Stolac municipalities, except in the area of Stari Neum, which is significantly more urban in comparison to the other towns the road is passing by.

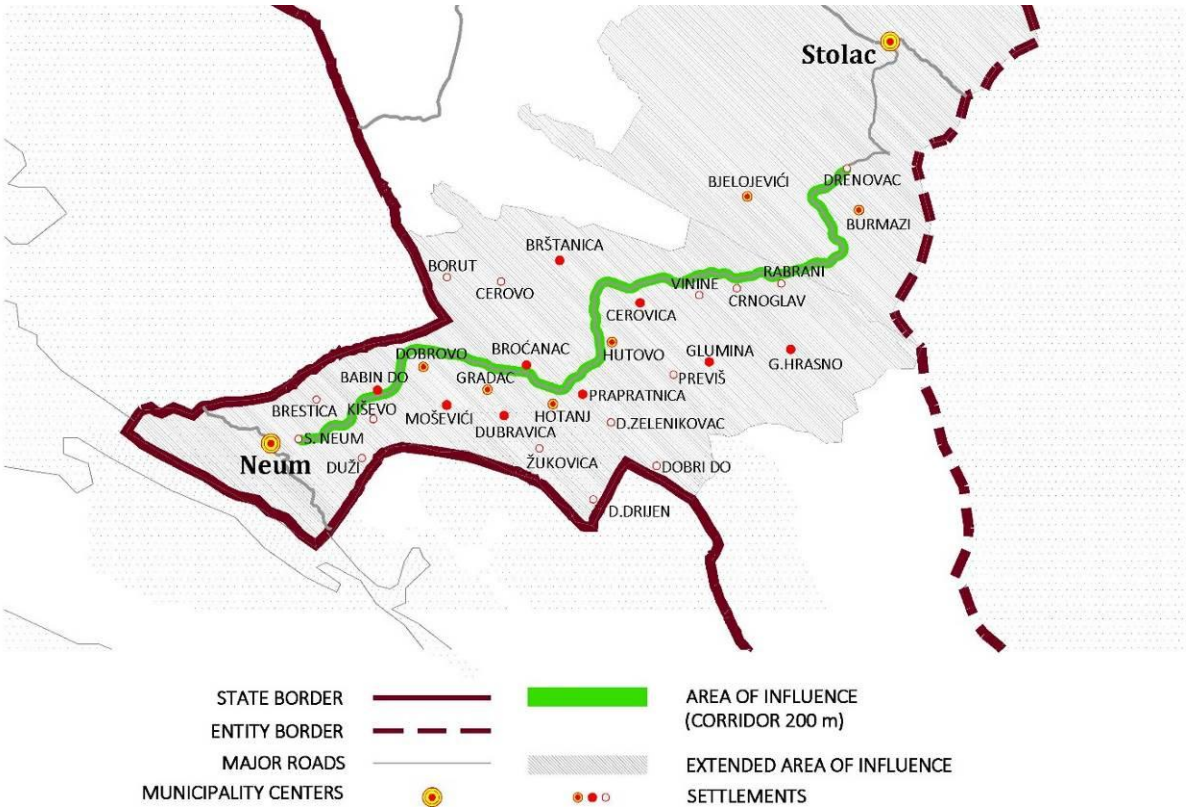
In line with the approach of the existing EIS, the influence area of the study is defined as the space along the route, i.e. the area of the corridor of 200 m (100 m on the left and 100 m to the right of the road axis). However, in areas where the route goes through or next to a populated area – the study area was extended to include those communities and identify potential environmental impacts of the road.

Area of influence for social impacts of the project can be differentiated to an area of direct and indirect influence.

Area of direct influence can be described as the territory of settlements which have a direct connection to the constructed road, within a radius of 1400 m. These communities will experience the most of the negative, but also the positive impacts of the project. In the Municipality of Neum the following populated areas have been included in the area of direct influence: Gradac, Hutovo, Dobrovo, Hotanj Hutovski, Cerovica, Moševići, Broćanac, Brštanica, Babin do, Dubravica, Glumina, Gornje Hrasno, Neum, Prapretnica, Vinine, Dobri do, Donji Zelenikovac, Rabrani, Duži, Previš, Cerovo, Žukovica, Crnoglav, Borut, Donji Drijen, Kiševo and Brestica. The area of impact of Stolac Municipality comprises of three communities: Burmazi, Bjelojevići and city-centre of Stolac. The entire population of Stolac lives in 21 communities with no organisation of local communities.

The indirect influence can be described as the territory of settlements which don't have a direct connection to the constructed road. These communities will avoid negative impacts caused by road construction (land acquisition, dust, noise etc) but will benefit from some of the positive effects, i.e. local economy development. Settlements indirectly affected are identified as 18 other communities in a northern part of Stolac municipality, and they are beyond radius defined in paragraph above.

Image 5. Area of influence



source: Ecoplan

5. SHORT DESCRIPTION OF THE ENVIRONMENT BASELINE

The area which the planned road passes through belongs to Municipalities of Stolac and Neum. Both municipalities are part of the Herzegovina-Neretva canton. More detailed overview of the population and macroeconomic indicators of these municipalities shall be shown in the chapter 6: *Short description of the socioeconomic baseline*.

The locality, where the realisation of the project of road M-17.3 Stolac –Neum is planned, is formed of stable karst terrain, where Mediterranean and sub-Mediterranean climate meet. The climate is known for considerable insolation, small precipitation, higher average annual temperatures when compared to Continental climate regions, longer vegetation period and windiness. This influenced the growth of vegetation specific for this area.

Vegetation is by its character xerothermic, arising from the karst terrain and influenced by sub -Mediterranean and Mediterranean climates. Mediterranean climate covers narrow belt around Neum, and it is consisted of communities of hard leaf-evergreen forests and maquis, helm oak and its degradation stages. The largest area is covered by sub-Mediterranean belt with belonging forest communities, that are predominantly a series of geographic variations in the form of degraded stages, from low forests through scrub, shrubbery to dry grasslands and rocky pastures. These forests have suffered major anthropogenic influence, so that now in fragments or in full we find all their regressive (degraded) stages Local vegetation consists of oriental hornbeam and oak, Spread on shallow limestone areas. All grass communities are diverse, and classified into many associations. Among the species that can be found at the area of the project, there are some rare and protected botanical species. One such specie is Dalmatian Laburnum (*Petteria ramentacea*), although its communities noted in these areas are very rare.

Apart from rare and protected species stated above, project area does not include elements of fauna, cultural resources and parts of nature that are formally protected on national (BH) level. There are also no indications that the project area or the immediate surroundings of the road have elements of natural habitats that may be of critical importance, or that may be endangered through the works on site. Fauna mostly consistes of small and medium game and large number of birds that seasonally reside in this area, but also a significant number of species that are residing all year long. Due to proximity of Hutovo Blato Nature Park and Ramsar Site (Nature Reserve), there are many groups of amphibians and insects, which are believed to be very important link in the chain of specific ecosystems represented in the wider area of the suggested project. At the nearest point to the Nature Reserve, some 2 kilometres from Cerovica, major impacts that can be anticipated deal with the potential increase in traffic-related air pollution particularly under the influence of southern and southwest winds, but in the ESIA these are foreseen as *potential and indirect* impacts. The area where the planned road passes through is mostly rolling country-lowland and hilly-rolling country terrain. Most of the route expands over hilly terrain, and only in its middle section (around

Prapratnica and Hutovo) passes around mountain Žaba (small Žaba). Geological analysis established that the entire new road advances through typical karst terrain, which is characterised by high water permeability. At the area of the route, there are not surface flows.

The area of the planned road is without industrial pollutants, so the high quality of the air is dominantly influenced by traffic air pollution coming from the existing road M17.3 Buna-Neum. However, this road is of low frequency traffic and it can be considered that the air in the area of impact is relatively clean.

Micro region where the considered road section goes through is exceptionally rich with cultural and historical heritage of different types, of functional type and chronological determination.

In the wider area of the route, which implies to the territory connected to close geographical regional and historical-cultural features, there are 35 national monuments, and a significant number of registered heritage assets, different by its character. In this area – subject of our general review - we find important architectural and archaeological heritage; there are individual assets that are registered (historical building and archaeological sites), and monumental ensemble (archaeological areas, building, natural buildings and historical ensembles). Large number of archaeological and historical areas is multifaceted, and there are material remains on them from several historical periods.

The area in which the construction of road has been foreseen, is characterized by the landscape values that are typical for this part of Herzegovina. The landscape of the area has a large presence of vegetation consisting of low bushes and wicker, which is closely bound by many types of creeping plants, and it is difficult to make passable. The landscape is additionaly completed by arable land and numerous olive groves intersected by dry stone walls, otherwise a typical scene for debris of the Herzegovina. The area of the mountain Velika Žaba makes a geographical boundary of a landscape wholes of high and low Herzegovina. Landscape features of these areas are determined by the specific climatic impacts, which are alternated spatially and temporally. In the karst of Herzegovina prevails evergreen vegetation, which makes the area lively throughout the year. In addition to the area densely covered with low vegetation, in the landscape of Herzegovina we meet also rocky ground on the borders of hills, where often there are traces of burning. In parts of the plains it is evident the oak tree with white and black hornbeam, whose thermophilic communities give a special value in a hot stone of the Herzegovina.

The corridor of the planned road goes mostly through rural parts of Stolac and Neum municipalities. Under direct zone of influence there are facilities of communal and physical infrastructure: parts of the water supply network, local paths and roads, and facilities of electric-energetic infrastructure and telecommunication infrastructure of the nearby settlements. All points of impact of listed facilities and the future road shall be solved within project documentation of higher priority.

Road M17.3 passes through the area where the war took place in period 1992-1995, and mine-contaminated areas in the municipality correspond to the zones of war operations. This problem is considered as a temporary restriction to space but its solution is largely complex as those mine-fields are of the unknown allocation with

individual mines, groups of mines, spread in a wide area. Some areas were mined and cleared of mines for several times during the war. According to the data obtained from BHMAC and used for preparation of the physical plans of Neum and Stolac, there is one surface with no risk[2] determined at the section Cerovica-Drenovac in the area of the community Stolovi. Although the area along the road is proclaimed safe, a special attention is needed during the earth moving works and blasting works, and in case of any doubt MAC BH will be contacted for further instructions.

[2] According to the classification of BIHMAC the areas of not-defined risk represent those areas for which the investigation was carried out and no risk was detected so they are proclaimed safe.

6. SHORT DESCRIPTION OF SOCIOECONIMIC BASELINE

Socio – economic impact in the area of the planned road is very distinct for the area south from the town of Stolac and entire Neum municipality area, economically strong for both municipalities equally, and weaker economic impact on the entire country.

The settlements of Neum municipality that are involved into this assessment: Neum, Gradac, Hutovo, Dobrovo, Hotanj Hutovski, Cerovica, Mošević, Broćanac, Brštanica, Babin do, Dubravica, Glumina, Gornje Hrasno, Prapretnica, Vinine, Dobri do, Donji Zelenikovac, Rabrani, Duži, Previš, Cerovo, Žukovica, Crnoglav, Borut, Donji Drijen, Kiševo and Brestica. The area of Stolac municipality includes three settlements and they are: Burmazi, Bjelojevići and Stolac centre. Image 4 shows an overview of all settlement that are under the impact of the project.

The new road section Stolac –Neum goes mostly through rural areas of those two municipalities except in the area of Stari Neum that is significantly urban. According to the preliminary results of the census of Federal Institute for Statistics in 2013 there were 4 960 inhabitants in Neum and 14 881 in Stolac. Unfortunately, the final result of the census that may give us more clear insight into structure of the population with all socio-economic components is not published yet.

In line with the rest of the country, net migration in the last 5 years in municipalities Neum and Stolac has mainly been negative. The reasons for emigrations are mostly economic.

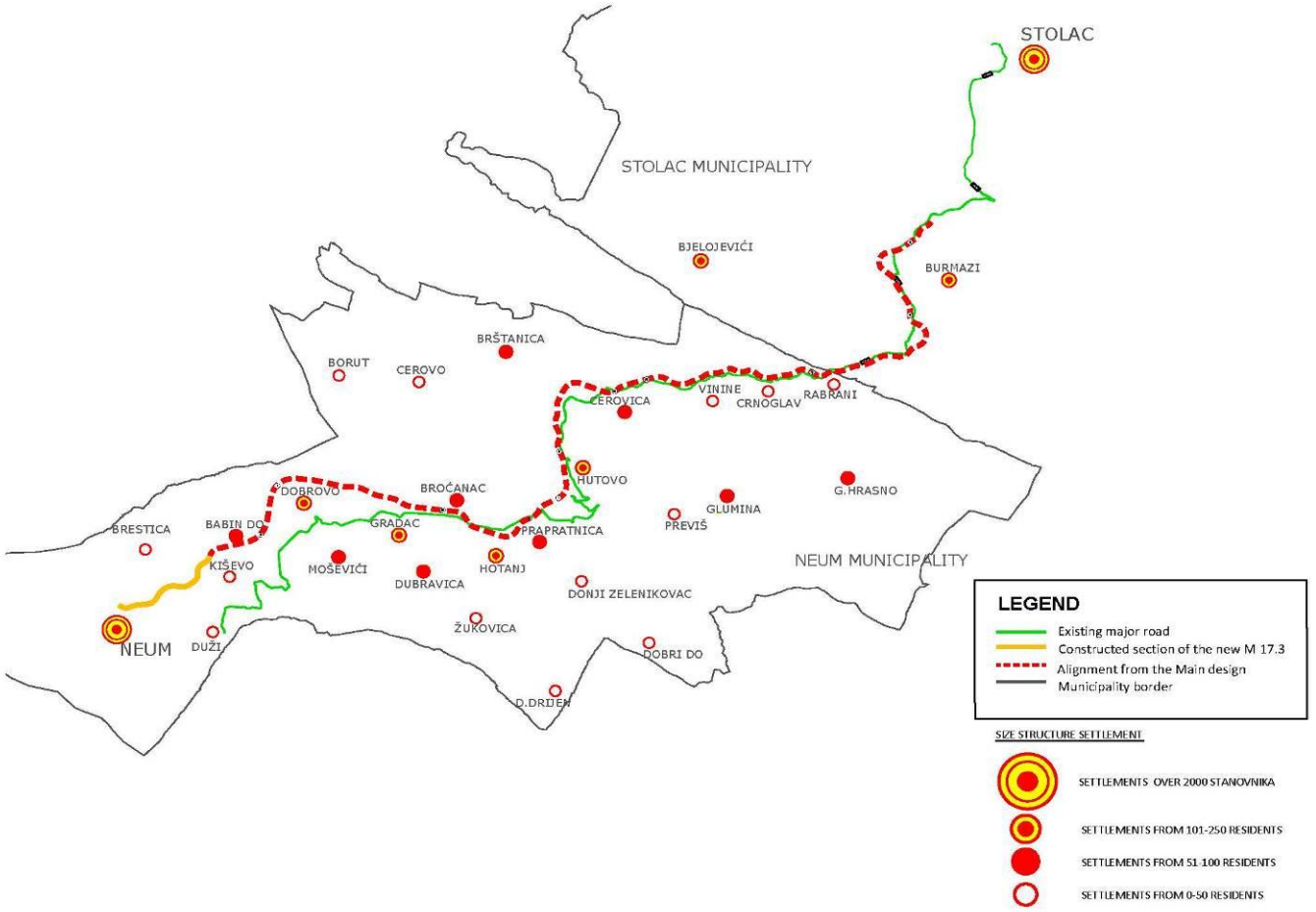
GDP per person in Neum municipality slightly increased throughout 2014 and it reached 12,583 BAM. GDP per person in municipality of Stolac in the year 2014 it was 2,775 BAM, what represents a raise of 2.32% in comparison to the year 2013.

In Neum municipality the number of employed persons was 1,035, what in comparison to previous year was an increase of 4.97 %, while in Stolac municipality there were 889 employed persons. The number of unemployed in Neum in the year 2014 was 390, which is by 7.4 % less than in the previous year. In Stolac municipality the number of unemployed in 2014 reached 2.127 persons, 1.4 % more than in 2013.

Salaries in Neum and Stolac municipalities in 2014 did not change much in relation to the last year. The average salary in Neum municipality was 772 BAM, and in Stolac 804 BAM.

As part of the preparation of this assessment, the company Ecoplan LTD Mostar conducted several focus groups that were held with the local population in which they did not come to any negative data or negative opinion from local population about the use of this road. Having in mind that the planning of the road is finished (i.e., Main Project completed) during which alternatives were debated, the population had at this point only positive opinion regarding the construction of the road.

Image 6. Overview of settlements in the area that the road passes through



7. DESCRIPTIONS OF THE POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS ON THE PROJECT AND MITIGATING MEASURES

7.1. GENERAL

Any substantial intervention in the environment results in different impacts, and construction of an infrastructural facility falls into this category. Such interventions alter the situation, cause permanent and/or temporary modification of landscape and the way of life and activities of people in the affected area.

Once the environmental and social aspects have been identified, the level of each individual impact, or undertaking certain activities in the area that can different environmental and social impacts is assessed.

In principle, potential impact concerning its nature may be positive and negative, direct and indirect, short and long term, and regarding its scope, it may be local, regional and national.

Direct impacts are manifested through disruption of the current conditions, the course of current activities and habits (increased noise, traffic or pollution).

Indirect impacts are manifested mostly throughout longer periods of time, they are cumulative and gradual, and therefore in most cases irretrievable.

Short-term impacts are more immediate, distinct, evident and direct, so they can be mitigated by implementing prescribed measures, whereas long-term impacts are more difficult to consider and assess, thus likelihood of being influenced is decreased.

Likelihood of an impact can be expressed as follows: certain, very likely, likely and unlikely. The extent of an impact is expressed as significant, strong, moderate, weak and insignificant, and no impact.

Given the importance, time and possibilities of their manifestation, impacts are generally divided as follows:

- Impacts during pre-construction phase ;
- Impacts during construction phase;
- Impacts during operation phase.

Due to the nature of the project, facility removal phase is not expected, considering that the planned road is deemed to be used over the longer period of time.

No other significant infrastructure project is planned to be executed within the same timeframe as the construction of M17.3, therefore no cumulative environmental and social impacts in the Project area are foreseeable at the present time.

Reduction of negative impacts is envisaged with appropriate measures described in a separate chapter, while the site-specific details shall be further defined in the Environmental and Social Management Plan (ESMP), which is to be drafted as a separate document.

7.2. POSITIVE IMPACTS

Positive impacts of the construction of the road Neum-Stolac, as well as the projects of the infrastructure in general, are reflected in social and economic benefits, which are a result of improved transportation conditions and the connection in the areas.

Positive impacts can be expressed the following way:

- Construction of the new highway shall unload the existing road that means the transit over border of BH;
- Better road connection and quicker access in the direction of the Nature park Hutovo Blato and numerous cultural, historical assets and sites, which are not accessible enough at this time;
- Better traffic infrastructure conditions, fewer traffic accidents, and with that less secondary negative impacts on the environment;
- Better accessibility to cultivating land, and conditionally development of the agriculture that is predominating as an economy branch in Neum hinterland and brings benefit to households;
- Decreased number of poor population due to increased economic activity and decrease of unemployed;
- Population affected by project shall have positive impact from additional incomes that are a consequence of expropriation;
- Local population and companies in the area of municipalities because of the increase of workers demand and increased activity in the market shall have positive impact;
- Part of the vulnerable groups shall have direct and indirect impact from the increased demand for the manpower;
- Municipalities shall have a benefit from the construction of the project through increased incomes of real sector as well as externalises overflow of positive economic effects on the political image of the area;
- Federal Ministry of Transportation and Connection, Cantonal Ministry of Transportation and Connection, Governments of Federation and HNC shall have an opportunity to use the project in the same way as the municipalities;
- Positive impacts on employees PC Roads FBH, construction workers, contractors, and surveillances of the works shall be the biggest because they are at the most direct relation to the stage of construction of this project. By gaining the experiences, increase of economic activity and increase of incomes are some of the positive impacts;
- Increase of all components of GDP, especially if the road shall be constructed by local company with big number of employees that are local, impact on canton and municipalities should be significant;
- Construction of the road M17.3 shall have positive impact on development of municipalities Neum and Stolac, and especially of their hinterland, that shall create and encourage positive synergies and improve social cohesion by giving

freedom of movement and assurance to the access to all possibilities of all citizens;

- Attracting already lost population into the rural part, and especially appeal and the return of the youth, which would influence the increase of birth rate and demography in overall, which should be the goal of the population policy.

7.3. SPECIFIC NEGATIVE IMPACTS

The largest negative impacts that are expected in the stage of road construction include:

- Air pollution and pollution of surrounding soil from dust and solid particles emissions due to construction works, machinery and transportation means;
- Increased noise and vibration due to construction machinery operation and works processes, which can negatively influence on local population and fauna;
- Potential damage to soil, including leaks, spills and land degradation, through the storage and siting of construction machinery, asphalt plants, equipment and materials.
- Loss of agricultural land, and disconnection of agricultural areas and areas for livestock grazing of households and settlements;
- Loss of vegetation and habitats due to execution of works;
- Decrease of managed hunting grounds and impact on game due to the proximity of the road ;
- Interference of torrential flows;
- Pollution of underground water and soil due to uncontrolled wastewater discharge from the road, as well as accidental or inappropriate leaking of oil and lubricants, and refuelling at the construction site;
- Damage to existing infrastructure during the time of execution of works (water supply system, electro-energetic and telecommunication networks), and damage to existing local and supply roads;
- Changes in the manner the land is used (access to plots, reduction of total plot area);
- Interference to life processes and activities of population alongside the road, and related traffic safety, especially in case of execution of works in summertime period which can cause additional traffic jams;
- Temporally occupancy of privately owned land for construction, access roads and accommodation of workers and mechanisation;
- Interference of work processes and activities of population along the road;
- Impact on tourism and economy of Neum municipality during the time of construction;
- Damages of existing structures of cultural – historical assets under and above the terrain during the execution of works;
- Violation of landscape features.

Most of the possible negative impacts, and especially those ones during the period of road construction, are of small intensity, of momentary and local character. The Environmental Impact Assessment identifies and analyses possible negative impacts on the environment, and to reduce and mitigate impacts, suitable measures are suggested.

During the construction and operational phase of the project, the road is unlikely to cause an impact on micro-climate of the area.

Implementing the predicted measures the impacts as mentioned above shall be reduced to a minimum or eliminated.

8. MITIGATING MEASURES OF NEGATIVE ENVIRONMENTAL AND SOCIAL IMPACTS

Any substantial intervention in the environment results in different impacts, and construction of an infrastructural facility falls into this category. Such interventions alter the situation, cause permanent and/or temporary modification of landscape and changes the way of life and activities of people in the affected area.

The measures for mitigation of negative impacts on the environment can be general and specific. General mitigation measures of negative impacts on the environment imply compliance with all relevant legal provisions regarding the protection of water, air, soil, landscape, species of plants and animals during all phases of realisation of a certain intervention in the environment – from the design, construction, use and maintenance of the object. These measures are legal obligations and compliance is proved in the process of obtaining various permits, hence the final result (i.e. environmental, water permit and certificate of occupation) implies full compliance with national legal provisions.

The compliance of these measures shall be checked by the Federal Department For Inspection Affairs, i.e. Inspectorate for urban and ecological manners.

The provisions of this ESIA, in particular the Environmental and Social Management Plan (ESMP), as an integral part of the ESIA, will be part of the bidding (tender) documentation for the actual works to be carried out, as well as the contract to be signed by PC Roads and the Contractor. As such, the obligation to implement the given mitigation and monitoring measures will be transferred to the Contractor. The monitoring measures that require actual sampling and measurements will need to be carried out through sub-contracting of an authorized agency or laboratory that can perform such tests preferably in FBIH/BIH or if such services are not available in country, abroad. Ultimately, the measures and tests that the Contractor does not conduct will remain the responsibility of PC Roads. The summarized results of the monitoring tests, and site specific details will be developed in a site-specific ESMP that is a condition to the start of works on the ground, and will need to be cleared by the World Bank team prior to the start of works.

Supervision of the works will be carried out by a separately contracted supervision company. One of the requirements in hiring a supervision company is the need to have an environmental specialist within the team, and to be able to supervise all aspects and requirements of this ESIA as well as the valid environmental permit. PC Roads will also conduct supervision on site and through documentation review through their in-house

environmental specialist, providing information and regular reports as agreed with the World Bank task team.

Specific mitigation measures of negative impacts, as well as enhancement measures of positive impacts on the environment are described below for all phases.

Table 8.-1. Environmental impact mitigation/ enhancement measures plan

Impact	Mitigation/enhancement measures
PRE-CONSTRUCTION	
Risks for all environmental components	▪ Considering the indirect impacts in the pre-construction phase, project documents need to be devised in accordance with legal regulations, environmental permit and prior water approval, geological, hydrogeological, agricultural, and woodland and other features of the area.
Negative impacts on landscape due to poor design decisions	▪ Include landscape architect into design and audit teams. ▪ Once more compare different design strategies in terms of landscape protection and reduction of permanent impacts. If the route is being laid by the edges of morphological units, respecting ground layers, negative effects could not only be mitigated but sometimes the road can add a completely new positive dimension to the landscape. ▪ Preserve agricultural area as one of the most important anthropogenic factors. ▪ Provide landscape protection through implementation of all mitigation measures described in Environmental Permit and Urban Consent. ▪ Ensure that relationship between traditional elements of life in karst areas remains intact, i.e. be careful not to intercept the path between fields/pastures and settlements.
Potential spontaneous construction along the road	▪ Through physical – planning documents provide the ban on building along the road and direct connection to it.
Disruption of harmony and integrity of the landscape	▪ Landscape Design Project, as included in the main design implies greening of all surfaces disrupted by the construction and setting up a buffer zone towards the settlements and the agricultural areas. Furthermore, the project should contain selection of the type and quantity of plants, substrates for planting, dynamics, as well as costs of planting and annual maintenance.
Enabling observation of the landscape, opening vistas	▪ Record all the best vistas and design viewpoints along the road.
Conflict of utilities with road alignment	▪ Considering the indirect impacts, separate documents which will forecast all conflicts of the road M17.3 with the existing infrastructural system: local roads, electric energy, water supply and telecommunication systems; as well as to resolve these conflicts, are to be included in frames of the main project design.
Compliance with national legislations regarding Construction site	▪ Obtaining all necessary certificates and equipment for execution of planned works. ▪ Preparation of Construction Site Organization Plan (CSOP), technological scheme, Management plan on Safety at Work and Management Plan on Fire Fighting and Explosion and Management Plan on Environmental Protection pursuant to the Decree on Construction Site Organization, Mandatory Documentation on Construction Site and Construction Work Participants, (Official

Impact	Mitigation/enhancement measures
	Gazette of FBH, No. 48/09, 75/09 and 93/12) and Waste Management Plan in accordance with the Waste Management Act (Official Gazette of FBH No. 33/03 and 32/09).
CONSTRUCTION	
Groundwater and soil pollution due to uncontrolled discharge of wastewater from road, as well as uncontrolled/accidental leakage of oil and lubricants from means of transport or construction machines, fuelling on construction site	▪ Implementation of water protection measures as determined in ESIA and ESMP. ▪ Performing works in accordance with Main Project, WMP and CSOP. ▪ Ensure appropriate supervision of works. ▪ Ensure areas with impermeable base for siting, repair of mechanization and prohibit repair of machinery and change of oil in the zone of inacceptable risk for groundwater. ▪ On the occasion of decanting and pouring oil special measures must be implemented to prevent incidental situations; If it comes to pollution by oil leakage or in some other way, that layer of soil should be removed and taken to landfill. ▪ Control waste storage and secondary raw materials storage. ▪ All waste from construction site must be disposed of in organized way by means of an authorized company. ▪ Change of vehicle and machinery batteries is to be performed in those parts of construction site which are ensured from possible leakage of hazardous substances into soil. ▪ Prevent leakage of polluted and uncontrolled discharge of wastewater from the area of construction site into soil; ▪ In stretches of road passing near sensitive zones of groundwater, blasting works need to be adopted to this special situation in order not to disrupt groundwater flows, i.e. apply the technique of millisecond activation of blasting charge with directed blasting action. ▪ All materials from excavation which will not be used immediately must be disposed of in planned location in accordance with CSOP (excess material depot), as well as outside of defined sensitive zones.
Impact on soil and land	▪ The land determined for use by the Project, including storage of building material, parking of the heavy machinery etc., can only be used for the construction activities and no other land is available for these activities in terms of preventing land disturbance. ▪ Proper waste disposal; separation of hazardous waste; engagement of authorized companies for final waste disposal. ▪ Oil and fuel collection systems to be fitted to prevent leakage. ▪ All excavated humus material shall be disposed of on planned sites, so it could be used later for the purpose of planting greenery. ▪ Set physical barriers and protective belts in zones of agricultural land areas to protect them from mechanical pollution and contamination.
Pollution of air and surrounding soil from	▪ Wetting the site to prevent dust occurrence during dry and warm weather conditions and particularly during high winds.

Impact	Mitigation/enhancement measures
emission of dust and soil particles due to work of construction machinery and means of transport	▪ When blasting the excavations in rock massif choosing the type of explosive which makes least harmful environmental impacts. ▪ For the use of blasting boreholes use boring-machines with dust collection in plastic bags. ▪ When transporting construction material and other small material cover it to prevent dissipation on the surrounding area. ▪ Regular maintenance of construction machinery: ensure maximum functionality of motor fuel combustions system; use and regular control of fuel with guaranteed quality standard.
Pollution of surrounding soil due to work of construction machines , improper use of solid and liquid waste or due to dissipation of hazardous material waste	▪ Perform all manipulations with petroleum and petroleum products with maximum protection measures to prevent spill. ▪ Collect and storage lubricants and worn-out parts, as well as packaging for oils and other products in organized way. ▪ Use only technically functional vehicles, engines with catalytic converters, unleaded fuel. ▪ Park the machinery only in places intended for machinery park, and take measures of protection from soil pollution by oil, petroleum and petroleum products. If it comes to pollution by oil leakage or in some other way, that layer of soil should be removed and taken to landfill. ▪ All surfaces damaged by construction works should be reinstated or landscaped after completion of works. ▪ Perform regular repair and washing of mechanization in areas planned for that purpose.
Loss of vegetation and potential habitats due to performance of construction works	▪ During organization and siting of construction site disrupt vegetation to the least possible extent, i.e. preserve vegetation cover to the highest possible extent. ▪ Fence the construction site to limit the area of adverse impact. ▪ Limit movement of heavy machinery in order to preserve vegetation to the highest extent possible. Parking areas for mechanization must be planned and repair of vehicles in this area must be prohibited. ▪ Take account of waste storage, particularly waste from the category of hazardous waste (lubricants, fuel) in order to minimize damages to surfaces. Waste disposal to be performed in legal landfills. ▪ Prior the commencement of the construction works, Contractor is obliged to perform a review and record any rare and endangered species, such as Dalmatian Laburnum (*Petteria ramentacea*) and provide precautionary measures to preserve them in line with expert guidance, if any are registered. ▪ Excess construction material should not be flattened into soil because large areas with autochthonous vegetation are destructed this way. ▪ Protect surfaces sensitive to erosion with stabilization means and plants that prevent erosion. ▪ CSOP is to plan temporary protection measures from erosion by water (constructing peripheral canals, covering artificial slopes with

Impact	Mitigation/enhancement measures
	water impermeable foils etc.).
Disturbing landscape features	▪ Reinstate landscape after completion of works, where possible; in parts of road where that is not possible, re-cultivate the environment in the way defined in Landscape design project.
Damages to the present Infrastructure and facilities (local roads, water supply, electric energy and telecommunication network)	▪ Minimize interruptions of local infrastructure as much as possible; where it is unavoidable, these works shall be organized in collaboration with municipalities and responsible institutions. ▪ Implementation of the provisions on providing timely information to citizens about upcoming interruptions. ▪ If there are damages done to the local infrastructure the Contractor shall restore the object to the original or better state.
Loss of wild game and prevention of natural migration routes	▪ Construct passages for animals; underpasses and culvers in line with the design documents. ▪ In collaboration with hunting associations, remove the existing hunting facilities and dislocate (feeding and watering points, observation points) to other locations or replace them with new ones, at a safe distance from the road.
Increased noise and vibrations due to work of construction machinery and work processes including blasting/excavation	▪ Implementing all measures from CSOP in order to reduce noise. ▪ Place noisy equipment further from sensitive recipients. ▪ Plan construction activities so as to avoid parallel activities of several devices close to receptor. ▪ Maintain mechanization (construction machinery and vehicles) in proper condition and use them when necessary. Equipment which is not used at the moment should be switched off. ▪ Using engineering techniques of noise control where practical (using mufflers, silencers etc.). ▪ Limit the activities that potentially produce much noise (for example, Pile driving drills, blasting and other activities,) only to working hours during day (from 7.00 to 19.00, Monday-Friday and from 7.00 to 13.00 Saturday) and avoid Sundays; exceptions can be applied for individual facilities such as tunnels. ▪ In case of blasting of excavations in rock massif choose the type of explosive which makes least harmful environmental impacts; apply the technique of millisecond activation of blasting charge with directed blasting action, to reduce the impact of superposition of dynamic impacts (vibration), noise and dust emission. Alternatively, use the technique of excavation by applying hydraulic hammer or mechanical switching by milling machines, "moles" and similar. ▪ The drilling and blasting works shall be minimized as far as possible. ▪ Drilling in cracks shall be avoided. ▪ The drill-hole grid has to be adapted to the individual geotechnical situation. ▪ In case of exceeding the permitted values, ensure protective equipment during work to workers and apply regulation on protection at work.
Danger from mines	▪ Performing works with additional attention and safety measures in

Impact	Mitigation/enhancement measures
	case of accident. ▪ Although the area near the road is proclaimed safe, a special attention is needed during the earth moving works and blasting works. In case of any doubt, works must be stopped and MAC BH has to be notified and contacted for consultations and further instructions.
OPERATION	
Wind impact on participants in traffic	▪ Setting wind-barriers at places of potential gusts of wind, pursuant to received complaints.
Pollution of groundwater and the surrounding land	▪ In the zone of sanitary protection of water source Blace stormwater from the road shall be collected in a controlled manner (drainage canals and pipes), and treated in appropriate water treatment system (oil-water separators). ▪ If monitoring of water show an increased level of pollution additional measures of protection are to be implemented. ▪ Regular maintenance of the system and facilities of wastewater from the road shall be implemented.
Pollution of agricultural and forest land due to waste created on the road and at resting places along the road	▪ Take care of communal waste which can be created on bus stops or in resting places; and dispose it in proper manner (provide impermeable containers for waste so that wild animals would not come for feeding) and take it away on a regular basis.
Animals injured in the attempt to cross the traffic road; Cutting migration routes of wild game	▪ Implementing periodic monitoring at points of conflict. ▪ Take record of animals getting injured with an aim of taking additional measures of protection, such as marking the places where wild game crosses the road, by means of appropriate signs. ▪ Take care of communal waste which might be left behind at bus stops or resting places, and dispose of it in the prescribed manner i.e. provide impermeable containers for waste so that animals would not come for feeding.
Disrupting landscape features of the area along the road by constructing facilities	▪ Ensure continuous implementation of prohibition of construction along the road and on direct connection to the road; all possible attempts of construction must be penalized in timely manner.
Pollution of agricultural and forest land by disposing exhaust gasses from vehicles	▪ Maintenance of green protective belts and physical barriers in zones of agricultural and forest land.
Increased danger from fire and destruction of forest land and vegetation along the road	▪ Warning signs must be placed next to the road, regarding prohibition of throwing cigarette buds and glass packaging, which is the most common cause of fire in summer months. ▪ Setting up a good and active fire protection system.

Impact	Mitigation/enhancement measures
Nature park Hutovo Blato	▪ Better transport connections and accessibility to this nature park and other cultural and historical assets and locations.
Incidental soil and water pollution due to collision, leakage of hazardous liquids into soil	▪ Traffic road is to be equipped with appropriate horizontal and vertical signalization, which includes necessary prohibitions and notifications in zones of possible water pollution. ▪ Traffic signals to be used to affect traffic participants, who transport hazardous substances in a way to reduce travel speed, increase the level of attention, prohibit stopping vehicles on the road and similar. ▪ Establish good cooperation with all public services. ▪ In case of pollution, urgent rehabilitation shall be implemented in line with Regulation on procedures and measures in cases of accidents on water and coastal water terrain, Official Gazette of FBH no. 71/09. ▪ In case of leakage of hazardous substances they must be diluted, neutralized and absorbed. Cleaning must be performed by an expert using all necessary prescribed protection resources.

LEGEND:	
	Negative impact
	Positive impact

Table 8.-2.Summary of Social impact mitigation/enhancement measures plan

Impact	Mitigation/enhancement measures
PRE-CONSTRUCTION	
Local overview and community support	▪ In order to consult the communities and enhance stakeholder support, due consideration should be taken when choosing the concept of the public consultations and presentation of the project. The presentation should contain the design, the financing method, the land acquisition phase and similar details which shall account to the readiness of government and PC Roads to complete this infrastructure project.
Access to water and sanitation electricity and telecommunications	▪ Considering the indirect impacts in the pre-construction phase, it is necessary to create separate documents which will forecast all conflicts of the road M17.3 with the existing infrastructural system: electric energy, water supply and telecommunication systems; as well as to resolve these conflicts. The documents are to be created in frames of the main project design. ▪ Use adequate and up to date utility mapping standards including but not limited to Existing records Surface features Electromagnetic/Radio Frequency Locators Ground Penetrating Radar Vacuum Excavations. ▪ Develop a Utility Conflict Matrix to provide management tool to deal with conflicts, organize relevant information on conflicts and alternatives and allow tracking of conflict resolution progress.
Dominant sectors	▪ During pre-Bid meetings, details on the bill of quantity and specific items of works shall be briefly discussed with PC Road of FBH and potential bidders to highlight type of works and related equipment and machinery likely to be engaged in these activities. This will continue to boost economy in construction sector. ▪ Inform potential investors about opportunities and potential of this area regarding road construction and its impact on tourism.
Land acquisition / involuntary resettlement	▪ Development and implementation of resettlement action plan (RAP) as resettlement instrument guiding the resettlement and compensation process in compliance with national Law and OP 4.12.RAPs must be consistent with the Project level RPF. ▪ Compensation at replacement cost of damage/loss according to the RAP. ▪ Timely compensation. ▪ Under this Project PC Roads FBH shall establish Grievance mechanisms prior to commencement of works and expropriation. The grievance mechanism shall serve as a forum to address complaints of PAPs and all other persons affected or impacted by the Project.
Cultural Heritage	▪ Implementation of detailed archaeological research and conservatory inspection of recorded sites along the route; recording the present state of objects and sites (stone walls, tombstones etc.).

Impact	Mitigation/enhancement measures
CONSTRUCTION	
Temporary worker in-migration and population change	▪ The contractor is obliged to arrange suitable worker accommodation for non-local workers. Provide that the road will be built between two urban settlements (one of which is a tourist town with high lodging availability), it is envisioned that the contractor will lease worker accommodation from the local, private market. In advance of the civil works, the affected ▪ Municipalities should communicate to the local community the upcoming demand for worker lodging and encourage private owners to early advertise lodging vacancies thus promoting leasing arrangements for vacancies that can accommodate construction workers. ▪ In addition any contractor shall ask for advice and recommendations of specific area of his interest most likely from Municipalities as forums most informed and involved in community activities. ▪ Managing Public Expectations by regular dissemination of information about temporary worker in-migration.
Gender	▪ Contractor shall prepare a staff engagement plan to allow where and when possible engagement of man and women equally depending on the specific position. The contractor will whenever possible employ women, depending on available trained and skilled labour.
Education and skills	▪ Workers included in construction works, especially those gone through vocational training will gain experience in this kind of construction works. ▪ Contractors to be encouraged to increase skill improvements at local level.
Employment	▪ Hiring guidelines for recruitment will be in place to promote transparency of the recruitment process. ▪ Equal opportunities and non-discrimination will be guaranteed in the recruiting process. ▪ There will be no distinction, exclusion or preference in the recruitment made on the basis of "race, colour, gender, religion, political opinion, marital status, national extraction or social origin, disability, age, sexual orientation, and/or HIV status." ▪ Selection criteria will include minimum age and skills requirements. ▪ All job vacancies will be listed clearly with skills and experience required to fill the position, as well as the duration of the employment contract. ▪ Clear information on the recruiting process and the selection criteria will be publically available and easy to access to promote transparency of the process. ▪ All contractors will be required to implement the hiring guidelines.
Access to water and sanitation electricity and	▪ During construction comply with major road designs with special care to unchartered utilities.

Impact	Mitigation/enhancement measures
telecommunications[3]	▪ Emergency and prompt reaction in case of disruption. ▪ Use adequate and up to date utility mapping standards including but not limited to Existing records Surface features Electromagnetic/Radio Frequency Locators Ground Penetrating Radar Vacuum Excavations. ▪ Develop a Utility Conflict Matrix to provide management tool to deal with conflicts, organize relevant information on conflicts and alternatives and allow tracking of conflict resolution progress.
Construction site health and safety risk	▪ Controlling the hazard at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc. ▪ Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration. ▪ Regarding the blasting works/works with explosives, the contractor must have certificates that prove the competence or qualifications for these activities, according to the Mining Act of the Federation of Bosnia and Herzegovina (Official Gazette of the FBH 27/10). Specific measures are: ▪ The Contractor is obliged to deliver drilling and blasting parameters with a blasting field sketch at minimum one week prior to the implementation of these works. ▪ Blasting field and the distance to the endangered objects and mechanization needs to be presented in a blasting field sketch. ▪ During the blasting ignition it is not permitted for anyone to be present in the area of the stone scattering zone. ▪ Before the blasting works a security needs to be placed at all possible access points to contain people and vehicles outside of the endangered zone. ▪ The beginning and the end of the blasting works needs to be announced with audio signals. ▪ In case of any losses of cleaning air by drilling no further drilling or blasting works shall be carried out at that point. ▪ Drilling and blasting works need to be coordinated with seismical measurements in nearby settlements according to the law. ▪ The blasting works need to be announced in advance to: Ministry of Internal Affairs of the HNC, police stations in Neum and/or Stolac, and local population (one day in advance and at the day of the blasting works via local media, especially local radio stations). ▪ The contractor is obliged to carry out all the necessary safety measures in line with the legislative for its part of the work; in case of non-performance thereof it is liable to the investor and competent inspection authorities. ▪ Providing appropriate personal protective equipment (PPE) in

[3] *Also see table 8.1. Environmental mitigation table section Infrastructure and facilities*

Impact	Mitigation/enhancement measures
	conjunction with training, use, and maintenance of the PPE. ▪ Evaluate contractor performance on worker welfare and implement penalties for non-compliance. ▪ OHS Training. ▪ Maintenance all mitigation measures proposed during the DNP. ▪ The Contractor shall at all times maintain the health and safety of the Contractor's Personnel in collaboration with local health authorities. ▪ The Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. ▪ The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. ▪ The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals. ▪ The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Communication (IEC) campaigns on the workers' code of conduct vis-a-vis the local community, at least every other month, addressed to all the Site staff and labour (including all the Contractor's employees, all Subcontractors and any other Contractor's or Employer's personnel, and all truck drivers and crew making deliveries to Site for construction activities) (ii) provide male or female condoms for all Site staff and labour as appropriate; and (iii) provide education/awareness raising activities in form of online presentation and brochure for STI and HIV/AIDS on screening, diagnosis, counselling and referral to a dedicated national STI and HIV/AIDS programme, (unless otherwise agreed) of all Site staff and labour..
Community health and safety risk	▪ Public dissemination of day-to-day traffic disruption ▪ Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions. ▪ Prepare an emergency response plan in case of emergency transportation to allow transport without delay to the intended destination. ▪ Maintenance all mitigation measures proposed during the DNP. ▪ The Contractor shall inform the local communities concerning the risks, dangers and impact, and appropriate avoidance behaviour

Impact	Mitigation/enhancement measures
	with respect to, of Sexually Transmitted Diseases (STD) - or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular
Local transport system	▪ Develop the traffic safety management plan.
Schools	▪ The transportation of construction material will be aligned to the school timeline. ▪ Timely information of work sequencing. ▪ Develop Traffic Management Plan in conjunction with road authorities to manage all temporary accesses, delivery of material and machinery. ▪ Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions.
Facilities for staff and labour / working conditions	▪ According to MDBH condition of contract except as otherwise stated, the contractor shall ensure all necessary accommodation and welfare facilities for contractor personnel. ▪ Promote compliance with national labour and employment laws and the fundamental principles and key regulatory standards embodied in the ILO conventions. ▪ Contractor shall comply with all relevant labour laws applicable, including costs related to their welfare, accommodation, daily fees, etc.
Income level	▪ Contractors should be encouraged to source local crops, meat and fish locally produced to feed themselves and their staff, use local services such as food preparation, cleaning facilities and laundry... ▪ The contractor should liaison with local suppliers to identify and quantify their potential and increase of capacity balanced with his demands. Activities required from contractor include, but not limited to publishing types of goods and services (food, beverage, cleaning services, repair shop services, etc) which contractor will procure in local media.
Poverty	▪ Advertise job opportunities related to the construction works well in advance. ▪ Contractors should be encouraged to procure locally equipment and vehicles, goods services and etc. that will be required during construction phase.
Agriculture and Farming[4]	▪ Farmers and cattlemen should be allowed to pass with their mechanization and livestock to their farming lands twice a day, when going and returning back to home. ▪ Cattleman to be encouraged to go to pasture away from construction site as far as possible. ▪ To sprinkle water on construction site to limit dust expansion on agriculture land.

[4] *See table 8.1. Environmental impacts; better access to arable land.*

Impact	Mitigation/enhancement measures
Tourism	▪ Tourist agencies that offer arrangements to Neum should be noticed about traffic disruptions in order to avoid their customers inconveniences during their vacations.
Land acquisition[5]/ Involuntary resettlement	▪ The condition precedent to commencement of any construction works is that compensation must be paid at replacement cost according to RPF and RAP. ▪ Continuation of raising awareness about Grievance mechanisms.
Cultural heritage	▪ Mandatory suspension of all works and informing the competent heritage protection service in case of discovery of cultural / archaeological findings. ▪ The Contractor is obligated to inform the Supervisory body for cultural heritage in case that construction works might have influence on any of 13 tumuli that are recorded to be in direct area of influence. ▪ Periodic monitoring of objects in the indirect area of influence is required in order to determine possible physical damage to the structures. This monitoring will be in the line to the work dynamic.
OPERATION	
Migration and population change	▪ Municipality to promote all positive aspects of the newly constructed road by presentation of improved access to public services and the coast for the revitalization of this area on an ongoing base.
Age	▪ The municipalities should develop different policies for positive demographic change. This measures should include improving and promoting transport accessibility, supporting entrepreneurship (especially SMEs), stronger local job creation, gender equality improvement, poverty reduction, immigration encouragement, youth, adult and elderly skills development, etc.
Employment	▪ Hiring guidelines for recruitment of construction site personnel will be in place to promote transparency in the recruitment process. ▪ Equal opportunities and non-discrimination will be guaranteed in the recruiting process. ▪ There will be no distinction, exclusion or preference in the recruitment made on the basis of "race, colour, gender, religion, political opinion, marital status, national extraction or social origin, disability, age, sexual orientation, and/or HIV status." ▪ Selection criteria will include minimum age and skills requirements. ▪ All contractors will be required to implement the hiring guidelines. ▪ All job vacancies will be listed clearly with skills and experience required to fill the position, as well as the duration of the employment contract. ▪ Clear information on the recruiting process and the selection criteria will be publically available and easy to access to promote transparency of the process.

[5] *See table 8.1. Environmental Impacts; Impact on agricultural land*

Impact	Mitigation/enhancement measures
	▪ Prior to civil works, the PC Roads FBH shall release an announcement to indicate commencement of the Project indicating what vocations and skills shall most likely be required during construction and backstopping activities and encourage vocational training.
Health services	▪ Publicly announce completion of construction and reduced time for travel. This would promote a constitution of habit to use easily accessible now medical centres in BH especially those in Mostar and Sarajevo.
Schools	▪ Publicly announce completion of construction and reduced time for travel. This would promote the option of choosing the most accessible school to attend.
Dominant sectors	▪ To encourage municipalities to implement physical plans in respect of rest areas along the road and related services.

LEGEND:	
	Negative impact
	Positive impact

9. PROGRAMME FOR MONITORING THE ENVIRONMENT CONDITION

Due to possible adverse impacts during the construction and use of the planned road, it is necessary to monitor and analyse the condition of fundamental components of the environment for which it is proven that could be endangered by negative impacts. Besides, it is possible to determine after the road is constructed that some of the predicted measures for mitigating environmental impacts are not sufficient, or even that the planned activities are not fully implemented.

As the eventual changes could be monitored, it is necessary to establish programme of monitoring of environment state (monitoring) which represents an integral part of understanding and valorisation of changes occurred at the environment. In the context of all those mentioned above, it is needed, before any execution of works, to have assessed zero condition about the quality of the environment.

Table 9.-1. Summary of Environmental Impacts Monitoring Plan

Which parameter is to be monitored?	**Where will the monitoring be performed?**
INITIAL STATE	
Groundwater quality: - Chemical analysis (PH, temperature, suspended particles, KPK, BPK5, ingredients with nitrogen) and standard bacteriological analyses	Water source Blace
Air quality: SO_2, smoke, NO_2, PM 10, according to legal regulations	Along road route near settlements and agricultural land
Physical-chemical and biological features of agricultural soil, according to legal regulations	According to instruction and collaboration with specialized institutions for monitoring soil quality, define organization of monitoring and a network of monitoring points
Forest and forest land: frequency and type of forest systems, character of forest communities and their commercial categories, zones of sensitivity to harmful impacts from mechanical damage and damage caused by contamination, soil analysis for agricultural land	In zones of corridors of direct and indirect impacts, according to instruction and collaboration with specialized institutions for monitoring soil quality, define organization of monitoring and a network of monitoring points

Which parameter is to be monitored?	Where will the monitoring be performed?
Physical distribution of Dalmatian Laburnum (*Petteria ramentacea*); Population size of other rare, endangered and endemic species	In zone of corridors of direct and indirect impacts
Migration routes of large and small wild game	In zone of corridors of direct and indirect impacts
CONSTRUCTION PHASE	
Air quality: SO_2, smoke, NO_2, PM 10, according to legal regulations	On construction site, in accordance with air quality monitoring program
Level of noise	Construction site
Physical-chemical and biological features of agricultural soil, according to legal regulations	According to the defined network of measuring places and dynamics of performance of works
Forests and forest land	According to the defined network of measuring places and dynamics of performance of works
Cultural-historical heritage	In zone of corridors of direct and indirect impacts
Fauna	In zone of corridors of direct and indirect impacts
Landscape	In zone of corridors of direct and indirect impacts
OPERATIONAL PHASE	
Groundwater quality: - Chemical analysis (PH, temperature, suspended particles, KPK, BPK5, ingredients with nitrogen) and standard bacteriological analyses	Collect data on quality of groundwater at water source Blace
Air quality: SO_2, smoke, NO_2, PM 10, according to legal regulations	In inhabited places along the road
Level of noise	For inhabited places and groups of houses along the road
Physical-chemical and biological features of agricultural soil, according to legal regulations	According to the defined network of measuring places
Forest and forest land	According to the defined network of

Which parameter is to be monitored?	Where will the monitoring be performed?
	measuring places
Landscape	Implementing prohibition of construction along the road and direct connection to the road

10. MONITORING OF ECONOMIC AND SOCIAL INDICATORS

The goal of monitoring indicators is a measurement of the Project success. Based on their measurements, it shall be known if the negative impacts are avoided, and positive increased. The role of social indicators is to confirm that the procedures and responsibilities prescribed in RAP are conducted in full and promptly, and that the compensations were paid to those eligible.

All indicators that are monitored during the operative stage, should be monitored 3 more years at the minimum after completion of the works, which corresponds to the Defect notification Period.

Table 10.-1. Summary of Social Impacts Monitoring Plan

Which parameter is to be monitored?	**Where will the monitoring be performed?**
CONSTRUCTION PHASE	
# of Grievance received and % of Grievance and comments addressed within the announce time-frame	Central Feedback Desk
Number of jobs created for men and women during project planning and construction Number of men-months	Contractor employment report and Municipality Economics Department
MAINTENANCE AND OPERATION PHASE	
Number of traffic accidents per AADT The number of killed in accidents per AADT The number of severely injured per AADT The number of slightly injured per AADT	At PC Roads FBH offices
The price of fuel at gas stations in Neum and comparable gas stations in the region	At Neum gas stations

11. CONSULTING OF PUBLIC AND GRIEVANCE MECHANISMS

Stakeholder must be informed and consulted about the project activities during the entire project cycle. Vulnerable categories must be kept up to date and consulted in appropriate ways, and engagement activities adjusted to their needs. They include persons or groups which are:

- Directly and/or indirectly affected by the project activities;
- Have certain "interest" connected with the Project or its activities;
- Have the ability to influence the Project itself or its final outcome.

First public consultation was held in Hutovo on November 11, 2015. During the presentation of the project, participants were informed about previous and future project activities. Representatives of PC Roads informed participants about previous public consultations held in Neum for main project design. On this occasion road alignment were changed to satisfy local community requirements. In addition, representatives of PC Roads informed participants about land acquisition process suspension due WB requests in order to harmonize this process with Banks Operational Policies.

Furthermore, consultant presented detailed road plans, maps, placement of tunnels, road intersections, etc. to the rest of the participants that were not familiar with road alignment. The Minutes of the First Public Discussion on ESIA held on November 11th 2015 in Hutovo, Municipality of Neum is Annex of the ESIA.

Public consultation of the subject ESIA report was organized after the World Bank and PC Roads of the FBH approved draft documents. The documents were published and available to the public in a local language on the website of PC Roads FBH on February 18th 2016, and public had 14 days to submit their comments in order to identify issues of concern and possible solutions. The public consultations were held on March 2nd 2016 in Hutovo, and the Minutes of the Second Public Discussion on ESIA is in Annex C of the ESIA.

It is important to mention that second part of this public hearing included a discussion about possible positive and negative impacts of this road on environment and community, and the PAPs' concerns were mainly focused on the project design, especially road alignment and junctions for settlements. During the discussion, all comments were addressed and answered.

12. ASSESSMENT CONCLUSION

Analysing the impacts of the planned road construction and operation, all negative environmental impacts of the Neum – Stolac road will be removed or minimized to the extent possible, provided strict compliance with proposed protective measures and ensuring monitoring the state of the environment, so in this sense it can be said that the planned project will not have significant negative impact on the environment in the project area.

From the study findings, it has been concluded that the social impacts of the proposed project are minor and easily mitigated. In fact, overall attitude of the communities in the affected area are positive towards the Project. Any disruption shall be temporary and offset by economic benefits. Within the scope of the engagement activities, stakeholders will be informed about the Project and their suggestions and opinions will also be recorded. In addition, a grievance mechanism will be used. The ESIA revealed that the majority of negative impacts are associated with the construction phase and that most of them can be mitigated through the implementation of good construction practice and the proposed mitigation measures, the implementation will be monitored and measures taken to reinforce, adapt or change if needed. There are no residual negative social impacts and their rating is assessed as not significant for negative and medium and minor for positive impacts. It is generally anticipated that the construction will bring short and long-term benefits.

Due to the lack of existing data, a site specific Environmental and Social Management Plan (ESMP) will be prepared prior to the start of works. The ESMP shall include a detailed environmental baseline, and findings of relevant surveys to reflect the specific conditions of the project site and development. The ESMP shall build on the provisions of the environmental permit, this ESIA, the EIS from 2009 but will be developed based on the principles and requirements of the World Bank policies for such documents.