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Chapter 17 Cumulative Impacts

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17 Cumulative Impacts

17.1 Assessment of Cumulative Impacts

The methodology for cumulative impact assessment follows the six-steps approach to a Rapid Cumulative Impact Assessment (RCIA)[1]. The focus of RCIA is to identify Valued Environmental and Social Components (VECs), determine their baseline conditions, identify relevant development and natural processes within the cumulative impact zone, assess the cumulative impacts and propose measures.

The assessment of cumulative impacts is based on the review of limited number of existing studies and plans available on the web site of local governments of Konjic and Mostar, electrical companies, telecommunication companies, and railway company as well as environmental permits issued for the developments of the project area. The analysis did not reveal any certain future infrastructure projects in the project area except for the construction of the adjacent sections of motorway on the Corridor Vc and construction of a municipal wastewater treatment plant in Konjic, however the available information was limited. Thus, the assessment has been undertaken to provide an understanding of the likely E&S effects of identified developments and enable adequate consideration of cumulative effects. Table 17-1 gives an overview of known developments, of which some have potential for expansion in the future, and possible impacts that can be expected from their operation/existence.

Table 17-1: Existing and planned infrastructure projects and possible impacts

Existing and planned infrastructure / projects in the Project area	Possible impacts from existing and planned infrastructure / projects during operation phase
Adjacent sections of motorway on the Corridor Vc yet to be constructed	Noise emission, air emission, surface run-off discharge, waste generation
Reconstruction of local roads as a part of community projects related to construction of motorway	Noise emission, air emission, surface run-off discharge, waste generation
Construction of the wastewater treatment plant for Konjic downstream from Konjic in the zone of Jablanicko lake	Noise emission, odour emission, waste generation
Main road M17	Noise emission, air emission, surface run-off discharge, waste generation
Existing and future railway corridor in the Konjic municipality (at the locations of Viaduct 3 and the bridge over the Jablanicko Lake/Neretva River belonging to the Konjic Bypass)	Noise emissions
Business zone Sipad Konjic located northeast of Konjic near to main road M17	Water use, water pollution, waste generation, noise emission
Construction of the future railway section on Corridor Vc	Noise emission, surface run-off discharge, waste generation

[1] IFC's Good Practice Handbook: Cumulative Impact Assessment and Management, 2013

Table 17-2 presents a summary of the identified VECs which have the potential to be under the impact of the motorway subsection development. VECs refer to sensitive or valued receptors of cumulative impacts.

Table 17-2: Identified Valued Environmental and Social Components

Physical	Biological	Social
Water quality	Habitat loss (land take)	Community health and safety
Air quality	Fragmentation of habitats	Transportation and access (local roads)
Noise	Aquatic ecology	Amenity (landscape and visual)
Waste generation		

During the construction phase the construction of this subsection may occur at the same time as the construction Ivan-Konjic sub-section and Mostar North Interchange. At this moment, it is not known when and for how long these two projects will overlap in time. Also, there is a possibility of the construction of the subsection together with the construction of the future railway on Corridor Vc. The environmental and social effects that motorway construction will have on the environment can be observed in conjunction with potential impacts from the construction of adjacent sections and observable impacts of the existing facilities listed in Table 17-1.

Table 17-3 below provides a summary of identified impacts during the construction phase.

Table 17-3: Summary of assessment of cumulative impacts assessment in the construction phase

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
Habitat loss and fragmentation	Larger areal of habitat loss and fragmentation when observed in conjunction with construction works on neighbouring sections.	In the area of Ovcari Intersection, there are habitats of Black hornbeam *Orno-Ostryetum*, White hornbeam (*Carpinietum orinetalis*), pubescent oak and black hornbeam (*Querco-Ostryetum carpinifolia*). The biodiversity values recorded in the Ovcari settlement where the cumulative impact may occur are not of high value as the area unfortunately suffered a forest fire in 2020. Loss of habitats is	Moderate	High	Moderate / Significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	Sensitivity	Significance / Impact evaluation
		unavoidable, however, the EBRD Policy states that Projects must aim for no net loss/net gain. The BMP requirements for the project include afforestation of the affected forest which will increase connectivity with the adjacent forest habitats. Should there be overlap in construction programmes on Ivan-Ovcari and Ovcari-Prenj Tunnel subsections, cumulative effects on these habitats are possible through linear fragmentation of habitats and temporary dispersion of species due to disturbance. The southern part of the alignment that connects with the Mostar North-Mostar South section does not have high value plant or fauna communities that may be impacted by fragmentation. Therefore, the activities in the area of Mostar North Interchange will not have a cumulative negative effect on the mentioned communities besides temporally limited disturbance caused by noise which will cause temporary avoidance behaviour. This section is dominated by habitats of White Hornbeam (*Carpinetum orientalis*), which are not the priority habitats. The Main Design of the Ivan-Konjic subsection is not yet completed, therefore it is not certain where permeable			

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		structures i.e., viaducts and tunnels may be. However, as the terrain is hilly, currently available documentation plans for 15 viaducts and five tunnels significantly avoiding fragmentation. Mostar North – Mostar South section does not have such structures planned at the beginning of the section but the Prenj Tunnel – Mostar North section includes a 2,200 m-long Tunnel 5 at the end of the subsection. It is expected construction of motorway will result in habitat fragmentation and behavioural change of fauna. The impact will be significantly avoided or minimized through construction of tunnels, installation of culverts and passages for small fauna, implementing requirements for maintenance of viaducts as underpasses for wildlife, creation of hop-overs for bats and compensation measures.			
Water quality	Impact on water quality of Tresanica and Neretva rivers in the Konjic area and their aquatic ecology	Impacts on water quality and aquatic ecology as result of construction works are possible in case of major accidents, such as leakage of oil mechanisation at the construction site, as well as uncontrolled discharge of wastewaters from the camp and direct construction works in the riverbed. Cumulative effects on water quality from motorway construction are observed in	Moderate	Medium	Moderate / Significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		conjunction with municipal wastewater discharge from surrounding settlements/ individual houses, as well as run-off discharge from M17. Discharges or leakages from the construction site are not expected to be large in quantities, they are temporary and reversible. In case of simultaneous construction of the new railway and this motorway section, there is possibility of aggravated temporary impact on water quality in the intersection zone. It is not possible to prescribe measures for already existing impacts from local roads and business zone. Therefore, this study will propose appropriate mitigation measures to reduce likelihood of occurrence and minimise impact on aquatic ecology and water quality from construction activities and thus, reduce cumulative impacts.			
Air Quality	Construction nuisance related to short term localised noise and dust	Cumulative effects on air quality from motorway construction are observed in conjunction with the air emissions from construction of adjacent sections and existing roads around the project area. Dominant type of emission from the construction activities is dust. Dominant type of emission from the existing traffic are exhaust gases. Therefore, the	Moderate	Low	Minor / Not significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		cumulative effects can mainly be observed from emissions of dust, carbon dioxide, nitrogen dioxide, and $PM_{2.5}$. GHG assessment also showed the increase of GHG emissions during construction. Tunnel construction by its nature produce dust that is ventilated outside of the tunnel pipe. It is not expected that dispersion of dust will reach closest houses in Konjic. The construction works are time limited, and impacts are temporary and reversible. Related to emission from traffic, the current air quality in Mostar and Konjic is satisfactory, the fluctuations in the parameters are present during winter. Air quality modelling has identified locations and appropriate timing of implementation of mitigation measures during motorway construction. Having all this in mind, this impact is evaluated as minor/not significant.			
Noise	Increase in noise level	During construction phase, noise emission will increase, however this will be temporary and limited to daytime periods since construction activities will be implemented during the daytime. Noise will be emitted from construction vehicles and machinery as well as from excavations and blasting/drilling.	Moderate	Medium	Moderate / Significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		Considering the existing noise caused by movement of vehicles on the main road M17 and occasional noise from railway transport and business zone Sipad it can be expected that ambient noise levels in settlement Tresanica in Konjic will be increased compared to the present state. Having in mind that construction of sections is done in settlements and near the houses, appropriate mitigation measures are needed to reduce the noise. Increased noise and vibration levels will be generated by increased traffic through local settlements, if two or more projects use the same local infrastructure, e.g., adjacent sections of the motorway and planned new railway.			
Waste generation	Waste collection and disposal	During construction activities significant quantities of excess excavated material will arise and need to be disposed. This is considered to be a cumulative impact in case the construction of adjacent motorway sections starts at the same time with the construction of this project. It is expected that each motorway section will have its own spoil disposal site(s). The proposed landfill sites Ovcari-Tunnel Prenj-Mostar South subsection have capacity that can receive more spoil than estimated in	Minor	Medium	Minor / Not significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		the Preliminary Design. The landfill that will receive spoil from the construction of Mostar North-Mostar South subsection is already selected. Therefore, no cumulative impacts are expected from disposal of construction waste from Ivan-Ovcari or Mostar North-Mostar South sections. Significant quantities of excavated material can be generated during the construction of the new railway in Konjic area. This project is in the Preliminary Design phase, and there is no information available at this moment. The excess soil from reconstruction of local roads (community projects) is expected to be low in quantity and can also be disposed to designated disposal sites. The cumulative impact can be expected from generation of municipal waste and other special categories of waste that are managed by licensed operators and are disposed either on operational landfill in Mostar and Konjic (municipal waste) or are disposed in appropriate manner (special waste categories).			
Transportation and access	Limited road access during the construction works	As a part of this project, local road infrastructure will be reconstructed to enable better access to residents. The cumulative effects of these works will limit but not fully restrict the movement in the project area. Cumulative	Moderate	Low	Negligible / Not Significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		impacts would largely depend on whether any (re)construction activities would overlap. A coordinated approach to planning of transportation and access to take account of multiple construction projects should be undertaken. The phased construction approach will be proposed to mitigate the impact upon transportation and access.			
Community health and safety	Impact on local residents and road users (incl. visitors to the airport)	Should there be overlap in construction programmes related to the motorway and the local roads reconstruction then increased traffic could potentially occur along some access roads, should the same ones be used, which could increase the risk to local communities and traffic and transport incidents. Stretches of road for which cumulative impacts on community health and safety could occur include nearby residential properties and houses. The activities should be coordinated, and appropriate traffic management plans and H&S plans produced and aligned to manage possible cumulative impacts to community health and safety which could occur during construction.	Moderate	Low	Negligible / Not Significant

During the operation phase of the motorway, the impacts generated are very similar to impacts from other existing infrastructure projects in the project area and

are likely to produce cumulative effects. Table 17-4 below provides a summary of cumulative impacts in the operation phase.

Table 17-4: Summary of cumulative impacts assessment in the operational phase

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
Biodiversity	Disturbance of species and potential collision	Cumulative impacts on biodiversity are possible due to existing disturbance of species and edge effect caused by existing infrastructure such as roads and railway. Specific mitigation measures are planned to protect biodiversity and proposed in BMP. It is expected that likelihood of occurrence of these impacts is low and limited to the project area. It is expected that species under impact have some capacity to absorb impacts. Therefore, when assessed in cumulative context, this impact is determined to be not significant.	Minor	Low	Negligible / Not significant
Water quality and aquatic ecology	Surface runoff and communal discharge	During the operation phase of the motorway both municipal communal wastewater at the location of the toll station and surface run-off will be generated. These two impacts can be observed in conjunction from pollution caused by surface-runoff discharge from M17 as well as communal wastewater discharge from settlements in vicinity of Neretva and Tresanica. However, all wastewater generated as a result of motorway construction will be properly collected and treated, therefore, it is considered that no cumulative impacts will occur. Moreover, the construction of wastewater treatment plant in Konjic will prevent future pollution from municipal and industrial wastewaters in the area.			No impact
Air Quality	Exhaust gasses from vehicles will adversely impact the air quality	Cumulative effects on air quality from motorway operation are observed in conjunction with the air emissions from existing roads and air traffic. The identified cumulative effects originate from exhaust emissions from local and motorway traffic including carbon dioxide, nitrogen dioxide, and $PM_{2.5}$. GHG assessment also showed increase of GHG emissions during operation of the motorway. The operation phase	Moderate	Medium	Moderate / Significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		(vehicle movement) contributes about 50% of the emitted gases in the project scenario. Here is to be noted that traffic intensity on M17 will be reduced, especially in case of Konjic bypass construction, and transit vehicles will be using the motorway. Nevertheless, according to the Traffic study, the traffic on M17 will be increased every year by 2%. On the other hand, the current air quality in Mostar and Konjic is satisfactory, the fluctuations in the parameters are present during winter. Strong winds in Mostar area coming from Adriatic Sea along the Neretva valley help in dispersing pollutants and preserving air quality. It is difficult to assess the impact on climate change as a result of GHG emissions because the baseline state is available only for BiH. Since the climate impacts are assessed to be moderate in magnitude and medium in sensitivity, the overall cumulative impact from air emissions is assessed as significant.			
Noise	Increase in noise level	Noise level will be increased compared to the present state due to the general increase of the number of vehicles and together with existing noise from the main road M17 and railway and business zone on the Konjic side. Existing ambient noise with increased number of vehicles on planned motorway will pose adverse effects to local population of closest settlements. Partially this impact will be mitigated with noise barriers that will be constructed on the motorway.	Moderate	Medium	Moderate/ Significant
Amenity	Visual impacts	Constructed motorway will permanently alter the landscape. Visual cumulative impacts are possible since the location is already intersected with existing infrastructure such as roads and railway. A motorway is a linear infrastructure project which does not accompanying visual effects (e.g., shadows, tall objects, smoke from the chimneys, etc.). The changes that will occur are detectable to the specific conditions on the site that will result in permanent change. However, it is very difficult to assess the sensitivity	Major	Negligible	Minor/ Not significant

VEC	Impact	Description of cumulative impacts	Assessment of cumulative impact		
			Magnitude	**Sensitivity**	**Significance / Impact evaluation**
		to the impact because it is mostly based on the subjective feeling of the observer. In assessment of this impact prevail the significance of this project for citizens of BiH. There are no applicable mitigation measures.			
Waste generation	Waste collection and disposal	During the operation phase, small amounts of municipal and special categories waste will be generated at the location of tool station and general maintenance activities. The cumulative impact can be expected in conjunction with other infrastructure and settlements/business zone in the project area whose users are also generating municipal waste and other special categories of waste. Since the amount of waste is not considered to be excessive and can be easily managed by public waste management companies, this impact is also considered to be insignificant.	Negligible	Negligible	Negligible/ Not significant

17.2 Mitigation and Enhancement Measures

Concerning the mitigation measures, a flexible approach to managing cumulative impacts is proposed, due to uncertainties associated with lack of spatial documentation and information about future projects in this area. Good inter-project communication between developers and contractors will be a key to manage cumulative impacts which result from construction impacts.

Key mitigation measures in the construction phase identified in the assessment are:

- Assurance that all construction vehicles' engines operate to national standards and are fully maintained (this implies that machines and vehicles to be used in construction activities must have use/operation permits and installed filters to reduce emission) and good construction practices, such as:
  - water spraying on roads and excavated material stockpiles,
  - covering vehicles carrying raw materials,
  - speed limits in areas of the construction site which have unmade road surfaces to limit dust,
  - the equipment and machinery need to be shut down when not in use, etc.
- Implementation of biodiversity protection measures in line with **Biodiversity Management Plan** (BMP).
- Implementation of best practice visual mitigation measures during construction, particularly near sensitive receptors where cumulative impacts could occur from overlapping construction activities.

> Coordinated traffic management plans and community health and safety plans to take account of local populations schedules, project construction and operational schedules.

In terms of measures during the operational phase, the following have been identified:

> Increased noise level may be mitigated with noise barriers; all the necessary noise panels and noise barriers will be installed in accordance with Main Design for Noise Management to ensure that noise levels at the closest receptors do not exceed national limits.

All the above mitigation measures are included in the appropriate chapters of ESMP.