

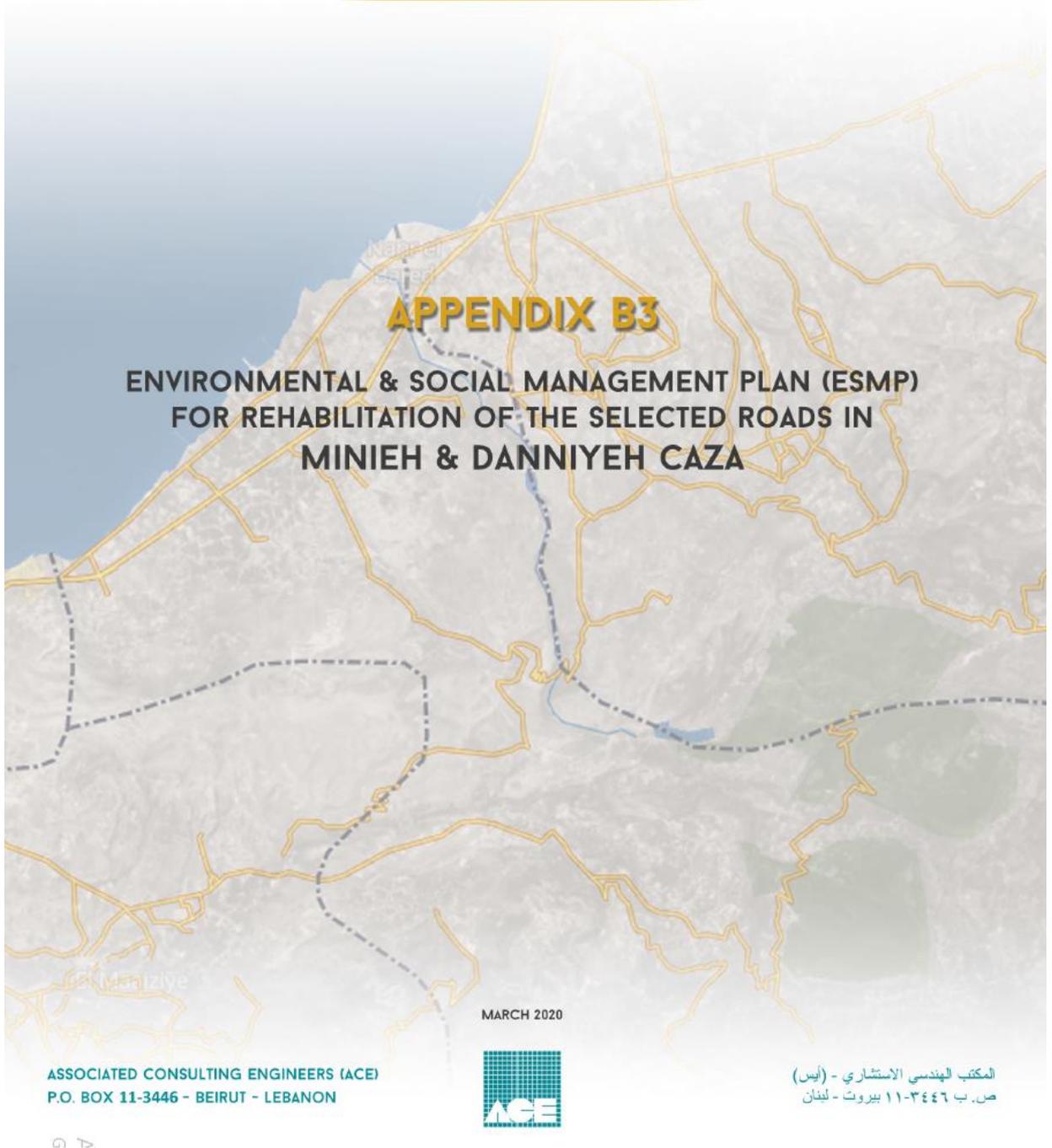
ROADS & EMPLOYMENT PROJECT



DETAILED ENGINEERING DESIGN FOR THE
REHABILITATION OF SELECTED ROAD LINKS IN LEBANON

LOT 4

AKKAR - MINIEH & DANNIYEH - ZGHARTA



MARCH 2020

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LIST OF ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACE	Associate Consulting Engineers
BOQs	Bill of Quantities
CBD	Convention on Biological Diversity
CDR	Council of Development and Reconstruction
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CO	Carbon Monoxide
COM	Council of Ministers
EA	Environmental Assessment
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plans
GBV	Gender-Based Violence
GRM	Grievance Redress Mechanism
IBA	Important Bird Area
IFC	International Finance Corporation
LARI	Lebanese Agriculture Research Institute
MOC	Ministry of Culture
MOE	Ministry of Environment
MOIM	Ministry of Interior and Municipalities
MOL	Ministry of Labor
MOPWT	Ministry of Public Works and Transportation
NAAQS	National Ambient Air Quality Standards
NGOs	Nongovernmental Organizations
NO	Nitrogen Monoxide

NOx	Nitrogen Oxides
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
REP	Road and Employment project
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
VAC	Violence Against Children
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization

EXECUTIVE SUMMARY – NON-TECHNICAL SUMMARY

ES1. Introduction

The Council for Development and Reconstruction (CDR) acting as an executing agency on behalf of the Lebanese Council of Ministers (COM) awarded a contract to Associated Consulting Engineers (ACE), hereinafter the Consultant, to prepare the assessment, design and Environmental and Social Management Plans (ESMP) of Lot 4 under Roads and Employment Project (REP). This project is funded by the World Bank (WB).

The Project's main objectives are to enhance the transport connectivity along selected secondary and tertiary road sections in different cazas and to create short-term job opportunities for the Lebanese and Syrian communities. The project will include the rehabilitation of urban and rural stretches of roads from all Lebanese regions. The project covers classified roads in 25 cazas throughout Lebanon with an expected total length of 835 km and grouped in six (6) lots. The project will be implemented over a period of five years.

This document represents an ESMP of the REP in Minieh-Danniyeh caza and it was prepared according to the WB OP 4.01 (Environmental Assessment). It covers all components of the proposed project during the rehabilitation and operation phase, assesses of the likely environmental and social consequences of a project, and determines the necessary measures to mitigate the negative ones and increase the positive impact on the environment and natural resources throughout a mitigation plan. In addition, the work included the development of a monitoring plan to ensure compliance of the project with environmental and social conditions and regulations. Moreover, public hearing sessions of the project were conducted and included the participation of the public and concerned communities.

ES2. Existing Policies, Legal and Administrative Framework

The governmental public institutions involved in the different stages of implementation of the roads project as well as its different components are CDR, Ministry of Public Works and Transportation (MOPWT), Ministry of Environment (MOE), Ministry of Labor (MOL), Ministry of Interior and Municipalities (MOIM), and the Ministry of Culture (MOC).

The various laws and regulations that road projects must abide by:

- Labor Law/1946: The Lebanese Labor Code
- law No. 335/2001: Pursuant to the International Labor Organization ILO Convention No 128
- law No. 400/2002: Pursuant to ILO Convention No 138
- Decree 8987/2012 Prohibition of employment of minors under the age of 18 in work that may harm their health, safety or morals
- Decree 3791/2016 Minimum Wage
- Decree 2761/1933 on The prohibition of wastewater discharge into water streams
- Decree 8735/1974 on the Conservation of Public Hygiene
- Law 64/1988: Protection of the environment against pollution from hazardous waste disposal and substances
- Law 558/1996: Protection of forests
- Law 80/2018: Integrated Solid Waste Management

- MOE Decision 52/1 (1996) and 8/1 (2001) on the Requirements to protect air, water, and soil pollution
- MOE Decision 8/1/2001 Revised standards for air emissions, liquid effluents and wastewater treatment plants
- Law 444/2002 Framework Law for Environmental Protection
- Law 77/2018: Water Law
- Law 78/2018: Air Quality Law
- Decree 11802/2008 Occupational prevention, safety, and health in all enterprises subject to the Code of Labor
- Decree-Law 118/1977 on the Municipal Act
- Law 37/2008 on the Cultural Policy Law
- Law 243/2012: New Traffic Law
- Legislative Decree 340/1943: Penal Code
- Law 58/1991: Expropriation law
- Law 53/2017: Amendment of Penal Code

The World Bank Policies and Procedures: OP/BP 4.01 on Environmental Assessment, classifies the proposed project under Category 'B' and OP/BP 4.12 on Involuntary Resettlement (However the project will not include land acquisition or resettlement). In addition to the Public consultation and Disclosure Policy under OP/BP 4.01.

According to OP/BP 4.01, the Bank requires that a public consultation with project-affected people and local nongovernmental organizations (NGOs) must be conducted for all projects under Category A and Category B. The aim of the consultation is to present to the public the components of the project along with potential environmental and social impacts and takes their comments and concerns into consideration

In addition, some international conventions and treaties are relevant to the project and are as follows: The United Nations Framework Convention on Climate Change (UNFCCC), Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), Convention on Biological Diversity (CBD), United Nations Convention to Combat Desertification (UNCCD), Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and International Labor Conventions.

ES3. Description of the Proposed Project

The study area where the proposed roads are located is the Caza of Minieh-Danniyeh of North Lebanon Governorate. The total number of the proposed roads to be rehabilitated under this project is 2 roads with a total length of 15.5 km. All of the roads are already existing and require rehabilitation of various components, including pavement, sidewalks, drainage, safety measures, and street lighting. The selection of the roads was determined by the Cabinet of Ministers in their Meeting Number 32 dated 27/06/2019.

The proposed project consists of the rehabilitation of existing roads in the Caza of Minieh-Danniyeh. The rehabilitation activities differ for each road depending on the pavement conditions and the road rating that was defined by the consultant.

Determining the condition of the asphalt is important to assign the proper pavement rehabilitation activities. The pavement rehabilitation activities consist of either pavement maintenance or overlay on existing pavement or complete removal of deteriorated pavement and constructing a new one.

The proposed project also consists of other activities beside the pavement rehabilitation works. These activities consist of:

- Construction or improvement of drainage systems
- Construction or improvement of retaining walls
- Installing concrete safety barriers
- Marking lanes and stoppage line
- Adding adequate traffic signs for stoppage give ways as warning signs, mirrors at sharp edges, and other regulatory and warning signs
- Rehabilitating sidewalks
- Repairing street lighting
- Relocation of existing utilities as needed

ES4. Baseline Environmental and Social Conditions

Topography, Geology and Hydrogeology

Minieh-Danniyeh of the North region, where the proposed roads are located, is around 110 km away from the capital of Beirut. It consists of two regions: Coastal Minieh-Danniyeh and the Upper Minieh-Danniyeh. The roads in Minieh-Danniyeh lie within a range of 300m (Ouyon El Samak) and 1000m (Sir El Danniyeh) above sea level. The main geological formation within the study belongs to the following: coarse torrential pudding (ncg), Miocene - marly conglomerates and reef limestones (m2), White marl and marl-limestones (C6), Maameltain or Ghazir Limestone, of Turonian age (C5), Sannine Limestone, of Cenomanian age unit (C4) and its subunits. As for the water sources, the proposed roads' site is in close proximity to EL Bared River and its tributaries. Also one of the roads (L4-MD-RD4) is near Ayoun El Samak Lake which lies between the districts of Danniyeh and Akkar. The study area is characterized by the presence of several springs such as Ain Markabta, Ain Es Sayed and Ain

Marmarr. Climate and Meteorology

The climate data of Qattine village were represented in this study. This village is part of Road L4-MD-RD6. Most rain events fall in the winter during the month of January with 225 mm of precipitations. However, the driest month is July. The average annual rainfall in Qattine is 1,001 mm. The average annual temperature in Qattine is 16.1 °C. The warmest month of the year is August with an average temperature of 24.5 °C. On the contrary, the coldest month of the year is January with an average temperature of 7.4 °C. The historical climate data (1982-2012) of the village Qattine were represented in a climograph as well as data obtained (temperature, precipitation, wind speed and wind direction) from the nearest meteorological station of the Lebanese Agriculture Research Institute (LARI).

Air Quality and Noise

Ambient air quality of the project area was requested from MOE. Data was available from the UNDP project "Air quality assessment in an East Mediterranean country: the case of Lebanon" which is based at the Ministry of Environment. The results have shown that the concentrations of NO₂ in all the studied cells comply with the national standards. As for the

concentrations of PM₁₀, the obtained values were in compliance with the WHO Guidelines while PM_{2.5} were not in compliance with the WHO standards for air quality. As for the level of noise in the region, as no data was available on the project location, observations during site visits showed that noise does not seem to be significant along most of the roads with no sources of noise pollution observed. However, the noise level was observed to be slightly higher around other populated areas.

Land Use/Land Cover

In Minieh-Danniyeh Caza, the most common land use is agriculture and grazing. During the site visits, different kind of trees and areas were observed such as the natural terrains with diverse vegetation along roads L4-MD-RD4 and the presence of Oak, Pine, Cypress, Figs and different fruit trees such as pears and apples along Road L4-MD-RD6. The table below represents the visual classification of land use based on google maps.

Municipality	Land Use
Azka	Sparsely populated with dense natural landscape
Btermaz	Sparsely populated with agriculture areas
Bzal (small part) - Akkar	Moderately populated with agriculture areas
Debaael	Sparsely populated with agriculture areas
Sir	Densely populated
Kattiné	Sparsely populated with agriculture areas
Qraine El Hazmieh	Sparsely populated with agriculture areas
Aïn El Tiné	Sparsely populated with agriculture areas
Karseita (small part)	Sparsely populated with agriculture areas
Beit El Faks	Sparsely populated with agriculture areas
Al-Sfiré	Moderately populated with agriculture areas

Biological Environment and Ecologically Sensitive Areas

Minieh-Dannieh is rich in biodiversity. This region is home to one of the evergreen coniferous tree called "Lazzab" or juniper that is a remarkable tree of the forest heritage of this region. The fauna includes mainly animals that are raised for livestock production and different wild animals such as the fox, the squirrel, the hedgehog, the striped hyena and the wild boar. The District of Minieh-Dannieh comprises the Upper Mountains of Akkar-Donnieh that were declared as an Important Bird Area (IBA). However, the nearest road (L4-MD-RD4) is about 4 km away from this IBA. As for the protected areas, Horsh Ehdén is the nearest Nature Reserve of project area and spams around 8 km from it. In addition, the area is planning to create a protected area under the name 'Lazzab Dannieh Nature Reserve' as this tree is becoming rare in this area and is a remarkable tree of the forest heritage of Dannieh.

Demographic Profile

North Lebanon has a total population of 781,930 of which 28% dwell in Minieh-Danniyeh Caza. In 2016, the population density in the Caza was 169 people per Km². Danniyeh is characterized by a high population growth according to the Territorial Strategic Development Plan of Danniyeh Region report. The large household size in Danniyeh region is explained by high fertility rates. The average household is composed of 4.7 members compared to 3.8 members on the national level. The Danniyeh region is characterized as a young region whereby 42.5% of the total population are below 18 years old and 70% are below 40 years. The total number of registered refugees in the project area was 6,053. Moreover, there are

44,502 Palestinian Refugees in Minieh-Danniyeh. The unemployment rate in the North Governorate is estimated at 8% compared to the national average of 6.4 %. Akkar/Minieh-Danniyeh District have experienced the highest percentages of overall and extreme poverty

Economic Activities

The main economic activity in Minieh-Danniyeh is agriculture whereby the income of 90% of the permanent residents originates totally or partially from agriculture. However, the poor management of water resources, use of traditional agricultural methods, and lack in agricultural experts, pharmacies and Veterinary establishments resulted in a decrease in gross agricultural areas. During the site visits, a school was identified along road L4-MD-RD4 as well as a health center and three restaurants. As for L4-MD-RD6, the observed features were car maintenance shops and small shops, three Mosques, a minimarket, a small bakery and a recreational site of Al Zahlan Grotto. Moreover, a hydropower plant was identified on El Bared river (L4-MD-RD4).

Education

In the Minieh-Danniyeh region illiteracy is concentrated at high age groups mainly among women. Moreover, a large group of the population (42%) has attained lower education whereby this group didn't reach intermediate levels.

Health Services

Despite the large number of specialists, doctors, nurses available in the region, the health sector in Minieh-Danniyeh is unable to provide basic medical services to residents. As such, the residents in the region, especially the poor ones, tend to rely on pharmacists' medical treatments and only refer to specialists when they are not cured by pharmacists' prescriptions

Cultural Heritage

Due to its historical ruins and its several cultures, Minieh-Danniyeh was inhabited since prehistoric ages. The Mamluk and Ottoman eras have shaped this region with their own determinants. However, none of these sites of archeological or cultural importance were detected by the team along the roads.

Summary of Baseline

During the site visit that was conducted in November 2018 and December 2019, all the sensitive areas that might be affected as a result of the proposed project are mainly health care centers and educational centers. All these establishments were identified along the project roads and detailed in the report.

ES5. Summary of Potential Environmental and Social Impacts and Mitigation during Rehabilitation and Operation Phases

Summary of Impacts and Mitigation during Rehabilitation Phase

Impact	Media	Nature	Mitigation Measures	Mitigation Responsibility
Environmental				

Impact	Media	Nature	Mitigation Measures	Mitigation Responsibility
Air pollution from emissions of machinery, trucks or open burning activities	Air, nearby communities and workers	N	Use properly maintained equipment Abide by a dust management plan Water the ground when extremely windy	Contractor
Dust pollution from construction and excavation activities	Air, nearby communities	N	Mix material in an enclosed space Cover material when transporting	
Noise pollution a result of transportation or delivery of raw materials, trucks movement, concrete mixing, drilling, construction and operation of heavy vehicle movement such as excavators	Nearby communities and workers	N	Maintenance of vehicles and machinery Excavation and any other noisy activity only during working hours Prohibit solid waste disposal into nearby areas and avoid practicing any project rehabilitation activity especially near the Lazzab nature reserve	Contractor
Contamination of surface water from improper disposal of wastewater from workers and of water coming from cleaning of machines and equipment Reduction in overall surface water quality due to improper disposal of construction waste Water pollution due to accidental spill of oils and chemicals	Water resources, soil, nearby communities	N	Install temporary structures to prevent runoff from reaching nearby water bodies Avoid working in rainy weather Connect the generated wastewater from workers to the sewage network or to polyethylene tank Discharge the pumped wastewater from the polyethylene tank into nearby operational wastewater treatment plants Prohibit the discharge of wastewater into nearby water bodies under any condition	Contractor
Contamination of soil from accidental spills of oils and chemicals on the soil from machines and trucks and from transportation of chemicals and oils	Soil, subsoil and land	N	Proper disposal of construction waste Proper waste management practices Reuse or recycle the generated waste whenever possible Reuse of excavated material whenever possible Disposal of excavated material in controlled dump sites Train workers on waste reduction procedures	Contractor
Improper disposal of cut volume may cause contamination of water bodies in rainy weather	Water resources	N	Reuse of excavated material whenever possible Disposal of excavated material in controlled dump sites	Contractor
Surface water and soil pollution from improper disposal of solid waste generated from workers and the used materials, construction waste from	Water resources, soil, subsoil and land	N	Proper disposal of construction waste Proper waste management practices Reuse or recycle the generated waste whenever possible	Contractor

Impact	Media	Nature	Mitigation Measures	Mitigation Responsibility
excavation and drilling activities			Reuse of excavated material whenever possible Disposal of excavated material in licensed sites Train workers on waste reduction procedures	
High consumption rates of electricity, fossil fuel, etc. contributing to overconsumption and depletion of fuel	Energy resources	N	Maintenance of the generators and trucks Light in the site offices shut down during the night Construction workers must be trained and provided with awareness sheets on efficient energy use Machinery and equipment must be turned off when not in use	Contractor
High consumption rates of water for construction related activities	Water resources	N	Use water in the most efficient way and reduce wastage	Contractor
Over extraction of borrowing material and depletion of natural resources (sand, aggregates, ...)	Soil, subsoil and land	N	Ensure that the borrow material are extracted from legal sites Avoid agricultural lands to extract borrowing material In case extraction was done from agricultural sites, store the top soil layer for future rehabilitation Rehabilitate the site where excavation was done	Contractor of the quarry site
Tree and floral species disturbance near the site during rehabilitation activities	Biodiversity and sensitive habitats	O	Maintenance of vehicles and machinery Excavation and any other noisy activity only during working hours	Contractor
Disturbance of animals and residents in the area from noise, light and dust	Biodiversity and sensitive habitats	N	Prohibit solid waste disposal into nearby areas and avoid practicing any project rehabilitation activity especially near the Lazzab nature reserve	
Material falling from vehicles during transport may cause traffic accidents or congestion	Nearby communities	N	Ensure traffic is not blocked during transportation Inform residents and place signs near the working areas Cover transported material Abide by traffic regulations Operate well maintained vehicles	Contractor
Injuries from car accidents due to the presence of construction sites and closure of some roads	Nearby communities	N	Traffic shall be secured via alternative routes to reach relevant destinations in case the works imply the temporary closure of this road Inform the local community about the location of detours, road	Contractor

Impact	Media	Nature	Mitigation Measures	Mitigation Responsibility
			blockages or diversions through public announcements and proper diversion signage GRM for surrounding communities	
Socioeconomic				
Creation of job opportunities for local communities	Labor influx, socio-economic activities	P	Priority hiring to qualified local community Daily registrations of workers and verification of their age to prevent child labor GRM for local communities	Contractor
Local garages will benefit from the equipment oil maintenance and residents will benefit from the rent fees of the offices and the equipment parking area.	Nearby communities, socio-economic activities	P	-	-
Discrimination from the local community against the foreign workers	Foreign Workers	N	Conduct awareness campaigns for the local community regarding foreign workers influx Inform the local community that worker will sign code of conduct before stating the work GRM for local communities and all relevant stakeholders	Contractor
Social tensions as a result of perception that foreign workers being offered a major proportion of the jobs created by the project	Local and foreign workers	N	Draft Codes of Conduct and the guidelines for a GBV and VAC Action Plan All workers should sign codes of conduct written in their native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority Training on gender-based aspects, internal and external GRM	Contractor
Child labor for construction activities	Local and foreign children	2N	Daily registrations of workers and verification of their age to prevent child labor Abide by the Labor Law Ensure the contractor is aware of the penalties that Labor Law imposes in the case of child labor Oblige the contractor to strictly abide by the Labor Law through the CDR tender documents that should include prohibition of child labor	Contractor
Traffic congestion in the concerned towns due to transport of construction materials, the material that may	Nearby communities, socio-economic activities	N	Ensure traffic is not blocked during transportation Inform residents and place signs near the working areas Cover transported material	Contractor

Impact	Media	Nature	Mitigation Measures	Mitigation Responsibility
fall or due to temporal road closure			Abide by traffic regulations Operate well maintained vehicles	
Potential occurrence of sexual abuse and exploitation incidents induced by labor influx	Nearby communities	N	Draft Codes of Conduct and the guidelines for a GBV and VAC Action Plan All workers should sign codes of conduct written in their native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority Training on gender-based aspects, internal and external GRM	Contractor
Disruption of local community to access services due to construction activities and temporal road closure	Nearby communities and socio-economic activities	N	Traffic shall be secured via alternative routes to reach relevant destinations in case the works imply the temporary closure of this road Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage GRM for surrounding communities	Contractor
Disruption to access to shops and recreational site as a result of construction activities and temporal road closure thus affecting livelihood of shop's owners and visitors	Shop's owners and visitors	N	Install temporarily structures (wooden boards) from the road to the shops, the recreational site entrance, the medical center, school and Mosques Proper installation of sign boards Timely completion of the rehabilitation phase	Contractor
Community and Occupational Health and Safety				
Accident and injuries to workers because of construction activities (mainly respiratory health risks)	Workers	2N	Workers to wear proper safety gear (PPE) Presence of first aid kits (at least three) on the construction site	Contractor
Dust generation and noise may cause health related problems to nearby residents	Nearby communities	N	Inform residents and place signs near the working areas Proper management of trucks and heavy machinery entering and exiting the construction site Develop a site-specific Public Health and Safety Plan and Occupational Health and Safety Apply Best Applicable Practices on Road Safety	

Summary of Impacts and Mitigation during Operation Phase

Impact	Media	Nature	Mitigation measures	Mitigation Responsibility
Environmental				

Impact	Media	Nature	Mitigation measures	Mitigation Responsibility
Increased vehicular pollutant levels in the area causing public health risks and other impacts on the environment	Air, Nearby communities	N	Ensure that the road is regularly maintained to ensure good surface conditions Frequent air quality monitoring must be done along the roads area to ensure that ambient air quality parameters are within the standards	Local authorities
Noise pollution from traffic related noise pollution; vibrations from engines and tires and use of pressure horns disturbing wildlife and nearby residential areas	Nearby communities, biodiversity and sensitive habitats	N	Installation of signs near sensitive areas to prevent people from using the pressure horns	Local authorities
Depletion of natural resources (fuel) used for street lighting purposes	Energy resources	N	Install s eco-friendly light fixtures for the street light infrastructure to reduce the consumption of non-renewable sources of energy	Local authorities
Disruption of animals movement leading to direct mortality or avoidance behaviour as a result of increased traffic load in the area	Biodiversity and sensitive habitats	N	Install speed limit and animal crossing signs at areas were animals cross the roads	Local authorities
Possible oil spills events transported through runoff and polluting nearby surface and groundwater bodies	Water resources, soil, subsoil and land, nearby communities	O	Ensure that the road is regularly maintained to ensure good surface conditions	Local authorities
Accident occurrence due to the enhancement of vehicular movement resulted from the improvement of road conditions	Socio-economic activities, nearby communities	N		
Socioeconomic				
Encouragement of new business opportunities, and marketing activities in project region, the increase in land values and facilitate the access to services and improve the living standards	Socio-economic activities, nearby communities	2P	-	-
Improvement in road conditions due to installation of proper safety signs	Socio-economic activities, nearby communities	P	-	-
Enhancement of tourism	Socio-economic activities, nearby communities	P	-	-
Community and Occupational Health and Safety				
Increased traffic, accidents rates and risk on pedestrians	Local and nearby communities	N	Apply Best Applicable Practices on Road Safety	Local authorities

ES6. Environmental and Social Management and Monitoring Plans

In order to mitigate all identified impacts, the following were proposed during both the rehabilitation and operation phase:

During Rehabilitation

- Construct temporary structures to prevent runoff from reaching nearby water bodies and avoid working in rainy weather
- Ensure the installation of the porta cabin toilets that are connected to the existing network or to the polyethylene tank if sewerage network is not available within the project site
- Discharged the collected wastewater in the polyethylene tank into nearby operational wastewater treatment plants
- Prohibit the discharge of wastewater into nearby water bodies
- Regular maintenance of vehicles, equipment and machinery
- Open burning of solid waste must be prohibited
- Vehicles must move at a low speed on unpaved
- Loading of raw material should be done under dust preventive measures
- Raw material storage areas should be covered
- Water should be sprinkled in order to suppress dust
- Transported material should be covered
- Regular maintenance of all noisy equipment and machinery
- Drilling and excavation activities should be executed only during working hours
- Heavy machinery such as percussion hammers and pneumatic drills should not be used during the night
- Reduce water wastage whenever possible
- Use dry-cleaning instead wet cleaning
- Training and awareness should be raised to workers concerning water conservation
- Water use for construction activities should not disturb the water availability and supply to the existing communities
- The light in the offices must be shut down during the night when offices are not in use
- Machinery and equipment must be turned off when not in use
- Avoid agriculture land for borrow materials;
- Ensure that the borrow material are extracted from legal quarrying sites
- Maintenance of vehicles and machinery
- Minimize noise by insulating machinery through installation of mufflers
- Drilling, excavation and any other noisy activity only during working hours
- All sources of light must be shut down during night time to avoid disturbance from light pollution at night
- Green landscape areas must be preserved whenever possible and none of the project rehabilitation activities should be practiced near the Lazzab Dannieh nature reserve and solid waste disposal must be prohibited into this area
- Warn the staff strictly not to involve in any unethical activities and to obey the local standards and cultural norms
- Select specific timings for the construction activities
- Ensure that the generated solid waste and liquid waste is disposed or discharged of in an environmentally friendly way and in selected areas
- Install temporary wooden boards from the road to the shops and visited places
- Proper installation of sign boards

- Timely completion of the rehabilitation phase
- Draft Codes of Conduct
- All workers including contractor, foreign workers and international consultants should sign codes of conduct
- All workers (locals and foreign, skilled and unskilled) shall be compensated equally as per the scale of market price rates
- Abide by the Labor Law and ensure that workers below 18 years are not engaged in construction works
- Ensure the contractor is aware of the penalties that Labor Law imposes in the case of child labor
- Oblige the contractor to strictly abide by the Labor Law through the CDR tender documents that should include prohibition of child labor
- Registration of workers and verification of their age to prevent child labor
- All workers are committed to prevent and report sexual abuse and exploitation incidents
- Respond to the reported incidents as a matter of priority.
- Conduct labor influx awareness campaigns for the local community
- GRM for local communities including all relevant stakeholders
- Install proper warning
- Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage
- A flagman should be positioned on the proposed roads to warn the passing cars and ensure the traffic is not blocked
- Coordinate with the municipality police to help in traffic management
- Restrict vehicles carrying construction materials during the daytime
- Cover the transported material by the trucks is well covered
- Workers should wear PPEs
- The contractor should abide by the assigned work schedule
- Proper safety and diversion signs must be installed at sensitive areas within the project area (i.e. near schools)
- Training of heavy machinery drivers about road safety
- Inform the local community about the construction schedule
- Install pedestrian and vehicular passages near residential areas
- Develop a site-specific Public Health and Safety Plan and Occupational Health and Safety
- Apply Best Applicable Practices on Road Safety

During Operation

- Maintain the storm water network collection system especially before the start of the rainy season
- Continually collect solid waste in order to prevent the blockage of the drainage system
- Ensure that the road is regularly maintained to ensure good surface conditions;
- Fixing speed limit along then roads
- Proper installation of warning signs should be placed near sensitive areas to prevent people from using the pressure horns
- Use of eco-friendly light bulbs for street lights
- Use dry cleaning techniques
- Install signs such as speed limit signs and animal crossing signs
- Apply Best Applicable Practices on Road Safety

ES7. Consultation, Disclosure and GRM

A public hearing was held at the union of Danniyeh Municipalities on Wednesday, 16 October 2019. The purpose of the hearing was to inform the stakeholders and the local NGOs about the proposed project that will rehabilitate 2 roads in Minieh-Danniyeh Caza and their accompanying infrastructural works and to take into account their concerns and feedback. Twenty people participated in the meeting including 4 women, two working in the Union of Danniyeh Municipalities, one woman is the director of the youth union of Danniyeh and the other is an accountant of an NGO responsible for development. During the session, different concerns were raised by the attendees especially those related to the selection of road L4-MD-RD6. Moreover, the women that participated in the women's session believe that the project will contribute positively to improving women's participation in the economy by making transportation safer and more convenient and mentioned that there must be clear coordination mechanism with the municipalities and other authorities during the rehabilitation phase to quickly address potential problems such as burst water or wastewater pipe. The NGOs consultations had been undertaken on the local and International levels. At the local level, NGOs that are specific to each Caza were invited to the public hearing. At the international level, the contacted NGOs cover the whole country. They are ANERA, ACTED and the Danish Refugee Council (DRC). These international NGOs were contacted to inform them about the project, disseminate it, ask them to circulate its impacts and activities among Syrian and tell them that they can inquire about additional information or submit a complaint (GRM). The activity of each of the invited local and international NGOs is mentioned in this report.

Moreover, a Grievance Redress Mechanism (GRM) will be accessible to all relevant stakeholders as well as for the internal employees, namely the laborers onsite.

ES.8 Conclusion

It was concluded that most of the negative impacts will occur during the rehabilitation phase. These impacts are mainly related to the disruption of nearby residents from the rehabilitation activities along with some impacts on the surrounding environment such as deterioration of soil and water quality if the generated liquid waste and solid waste were not managed properly. In addition to the negative impact on the air quality that might arise as a result of heavy rehabilitation activities especially where new pavement is proposed for the roads. On the other hand, job opportunities will be created to the local community during the rehabilitation phase which is considered as a positive impact. However, these impacts are short in term and will diminish as soon as the project is completed. The assessed socioeconomic impacts during the operational phase were mostly positive in nature in terms of traffic and road safety and livelihood improvement within the project area. However, on the long term the proposed project will contribute in increasing vehicular pollutant levels in the area as well as traffic related noise causing public health problems and other impacts on the environment. Nevertheless, the negative environmental impacts that might arise from the rehabilitation of the proposed roads in Minnieh-Danniyeh caza can be minimized and even eliminated through proper management and mitigation practices that were proposed in the report.

ملخص تنفيذي - موجز غير تقني

مقدمة

منح مجلس الانماء والاعمار، الذي يعمل كجهة منفذة بإسم مجلس الوزراء اللبناني، عقدا للشركة الإستشارية العالمية الهندسية (ACE)، المستشار، لإعداد خطة إدارة بيئية واجتماعية لـ "Lot 4" في اطار مشروع الطرق والعمالة في لبنان الممول من البنك الدولي.

يهدف هذا المشروع إلى تحسين قطاع الطرق من طرق ثانوية وفرعية في عدة بلدات من كافة الأفضية اللبنانية، وخلق فرص عمل قصيرة الأجل للمجتمعات اللبنانية والسورية. يتضمن المشروع إعادة تأهيل الطرقات الممتدة في المناطق المدنية والريفية في جميع المناطق اللبنانية. يغطي المشروع طرقات مصنفة في ٢٥ قضاء في جميع أنحاء لبنان حيث يبلغ طولها الإجمالي المتوقع ٨٣٥ كيلومترا، موزعة على ست مجموعات وسينفذ المشروع على مدى خمس سنوات.

يمثل هذا التقرير خطة الإدارة البيئية والاجتماعية لقضاء المنية-الضنية، وقد أعدت الدراسة وفقا لسياسة ضمانات البنك الدولي (سياسة تشغيلية رقم ٤,٠١) (التقييم البيئي). هذا المستند يغطي أيضا جميع عناصر المشروع المقترح خلال مرحلة إعادة التأهيل والتشغيل، ويقيم الأثار البيئية والاجتماعية المحتملة من المشروع، ويحدد التدابير اللازمة للتخفيف من الأثار السلبية وزيادة الأثر الإيجابي على البيئة والموارد الطبيعية من خلال خطة الإجراءات التخفيفية للأثار السلبية. وإضافة إلى ذلك، يتضمن العمل وضع خطة تحديد وسائل الرصد والمراقبة لضمان إمتثال المشروع للأنظمة البيئية والاجتماعية. بالإضافة، عقدت جلسات المشاورة العامة وشملت مشاركة المعنيين والهتمين بالمشروع.

السياسات القائمة والإطار القانوني والإداري

المؤسسات الحكومية العامة المعنية بمختلف مراحل تنفيذ مشروع الطرق، فضلا عن مختلف مكوناتها المؤلفة من مجلس الإنماء والإعمار ووزارة النقل ووزارة الأشغال العامة ووزارة البيئة ووزارة العمل ووزارة الداخلية والبلديات ووزارة الثقافة.

القوانين واللوائح المختلفة التي يجب ان تتقيد بها مشروعات الطرق:

- قانون العمل/١٩٤٦: قانون العمل اللبناني
- قانون رقم ٢٠٠١/٣٣٥: عملا باتفاقية منظمة العمل الدولية رقم ١٢٨
- قانون رقم ٢٠٠٢/٤٠٠: عملا باتفاقية منظمة العمل الدولية رقم ١٣٨
- مرسوم ٢٠١٢/٨٩٨٧: تحظر استخداما الأحداث قبل بلوغهم سن ١٨ في الأعمال التي تشكل خطر على صحتهم أو سلامتهم أو سلوكهم الأخلاقي
- مرسوم ٢٠١٦/٣٧٩١: تعديل المرسوم رقم ٧٤٢٦ تاريخ ٢٠١٢/١/٢٥ المتعلق بتعيين الحد الأدنى الرسمي لأجور المستخدمين والعمال الخاضعين لقانون العمل ونسبة غلاء المعيشة وكيفية تطبيقها
- مرسوم ١٩٣٣/٢٧٦١: التعليمات المتعلقة بتصريف المياه المبتذلة والمواد القذرة
- مرسوم ١٩٧٤/٨٧٣٥: المحافظة على النظافة العامة
- قانون ١٩٨٨/٦٤: المحافظة على البيئة ضد التلوث من النفايات الضارة والمواد الخطرة
- قانون ١٩٩٦/٥٥٨: قانون حماية الغابات
- قانون ٢٠١٨/٨٠: الإدارة المتكاملة للنفايات الصلبة
- قرار وزارة البيئة رقم ١/٥٢ (١٩٩٦) و١/٨ (٢٠٠١): تحديد المواصفات والنسب الخاصة للحد من تلوث الهواء والمياه والتربة
- قرار ٢٠٠١/١/٨: المواصفات والمعايير المتعلقة بملوثات الهواء والنفايات السائلة المتولدة عن المؤسسات المصنفة ومحطات معالجة المياه المبتذلة
- قانون ٢٠٠٢/٤٤٤: قانون حماية البيئة
- قانون ٢٠١٨/٧٧: قانون المياه
- قانون ٢٠١٨/٧٨: قانون حماية نوعية الهواء

- مرسوم ٢٠٠٤/١١٨٠٢: تنظيم الوقاية والسلامة والصحة المهنية في كافة المؤسسات الخاضعة لقانون العمل
- المرسوم الاشتراعي رقم ١٩٧٧/١١٨ قانون البلديات
- قانون ٢٠٠٨/٣٧: قانون الممتلكات الثقافية
- قانون ٢٠١٢/٢٤٣: قانون السير الجديد
- المرسوم التشريعي ١٩٤٣/٣٤٠: قانون العقوبات
- قانون ١٩٩١/٥٨: قانون الاستملاك
- قانون ٢٠١٧/٥٣: الغاء المادة ٥٢٢ وتعديل بعض مواد قانون العقوبات

سياسات وقوانين البنك الدولي: السياسة التنفيذية رقم ٤,٠١ بشأن التقييم البيئي، يصنف المشروع المقترح في إطار الفئة "B" و السياسة التنفيذية رقم ٤,١٢ بشأن إعادة التوطين الجبري (غير أن المشروع لن يشمل حيازة الأراضي أو إعادة التوطين) بالإضافة إلى سياسة أجماعات الحلقة التشاورية و عرض النتائج بموجب السياسة التنفيذية رقم ٤,٠١.

وفقا للسياسة التنفيذية رقم ٤,٠١ يشترط البنك الدولي إجراء اجتماع حلقة تشاورية ومع العديد من المهتمين والمعنيين بالمشروع والمنظمات غير الحكومية المحلية بشأن جميع المشاريع التي تندرج في الفئة A والفئة B. والهدف من هذه المشاورات هو عرض عناصر المشروع إلى جانب الآثار البيئية والاجتماعية التي يمكن ان تنتج، وأخذ كل تساؤلات و ملاحظات الموجودين بالأعتبار.

وبالإضافة إلى ذلك، لقد تم عرض في هذا المستند بعض الإتفاقيات والمعاهدات الدولية ذات صلة بالمشروع وهي كما يلي: إتفاقية الأمم المتحدة المتعلقة بإطار العمل بشأن تغير المناخ، واتفاقية القضاء على جميع أشكال التمييز ضد المرأة واتفاقية التنوع البيولوجي واتفاقية الأمم المتحدة لمكافحة التصحر واتفاقية بازل بشأن تنظيم نقل النفايات الخطرة عبر الحدود والتخلص منها وإتفاقيات العمل الدولية.

وصف المشروع المقترح

يقع المشروع المقترح في قضاء المنية-الضنية، محافظة الشمال. يبلغ مجموع الطرق المقترحة والتي سيتم تأهيلها في إطار هذا المشروع اثنان ويبلغ طولهما الإجمالي ١٥,٥ كيلومترا. جميع الطرق موجودة سابقا وتتطلب إعادة تأهيل لمختلف مكوناتها بما في ذلك من الطبقات الإسفلتية والاساس، الأرصفة، عبارات لتصريف مياه الأمطار وشبكات إنارة. ولقد اختيرت الطرقات من خلال إجتماع مجلس الوزراء رقم ٣٢ بتاريخ ٢٠١٩/٦/٢٧.

يتضمن المشروع المقترح إعادة تأهيل طرق موجودة سابقا في قضاء المنية-الضنية. وتختلف أنشطة إعادة التأهيل بالنسبة لكل طريق حسب ظروف الطبقات الإسفلتية والاساس و تصنيف الطرق التي حددها الإستشاري.

بهدف تحديد أنشطة إعادة التأهيل المناسبة، من المهم دراسة حالة الطبقات الإسفلتية والاساس. وتتألف أنشطة إعادة تأهيل الطرق: صيانة أو غشاء الطبقات الإسفلتية القائم أو إزالة الطبقات الإسفلتية المتدهورة بالكامل وإعادة انشاءها من جديد.

ويتضمن المشروع المقترح أيضا أنشطة أخرى إلى جانب أعمال إعادة التأهيل. وتتألف هذه الأنشطة من:

- تأمين/تأهيل أقتنية، عبارات لتصريف مياه الأمطار
- تأمين/تأهيل جدران دعم إستنادية
- تأمين/تأهيل حواجز سلامة جانبية
- تخطيط الطرقات
- تأمين/تأهيل إشارات سير و إشارات تحذير
- تأهيل أرصفة
- تأهيل شبكات إنارة
- نقل المرافق الموجودة حسب الحاجة

الوضع البيئي والاجتماعي الحالي

التضاريس والجيولوجيا والهيدروجيولوجيا

تقع المنية-الضنية في المنطقة الشمالية، حيث تبعد الطرق المقترحة فيها حوالي ١١٠ كيلومتر من العاصمة بيروت. وتتكون المنية-الضنية من منطقتين: المنية-الضنية الساحلية والمنية-الضنية العليا. وتقع الطرق في المنية-الضنية ضمن مدى ٣٠٠ متر (عيون السمك) و ١٠٠٠ متر (سير الضنية) فوق مستوى سطح البحر. ينتمي التكوين الجيولوجي الرئيسي داخل منطقة الدراسة إلى ما يلي: coarse torrential pudding (ncg), Miocene - marly conglomerates and reef limestones (m2), White marl and marl-limestones (C6), Maameltain or Ghazir Limestone, of Turonian age (C5), Sannine Limestone, of Cenomanian age unit (C4) and its subunits (C5). أما بالنسبة لمصادر المياه، فإن موقع الطرق المقترح قريب جدا من نهر البارود وروافده. كما أن أحد الطرق L4-MD-RD4 تقع بالقرب من بحيرة عيون السمك التي تقع بين قضائي الضنية و عكار. وتتميز منطقة الدراسة بوجود العديد من الينابيع، مثل عين مركبتا وعين السيد وعين مرمر.

المناخ والأرصاد الجوية

مناخ قرية قطين معروف في منطقة المشروع. هذه القرية هي جزء من طريق L4-MD-RD6. تهطل معظم الأمطار في الشتاء خلال شهر كانون الثاني/يناير مع متوسط هطول قدره ٢٢٥ ملم. إلا أن الشهر الأكثر جفافا هو شهر تموز/يوليو. يبلغ معدل هطول الأمطار السنوية في القطين ١٠٠١ ملم. أما متوسط درجة الحرارة السنوية في القطين هو ١٦.١ درجة مئوية. في شهر أغسطس/آب يكون متوسط درجات الحرارة ٢٤.٥ درجة مئوية. يكون الشهر الأكثر برودة شهر يناير/كانون الثاني، حيث يبلغ متوسط درجات الحرارة ٧.٤ درجة مئوية. وكانت بيانات المناخ التاريخية (١٩٨٢-٢٠١٢) لقرية قطين ممثلة في رسم بياني مناخي وكذلك في البيانات التي تم الحصول عليها (درجة الحرارة والهطول وسرعة الرياح واتجاه الرياح) من أقرب محطة أرصاد جوية التابعة لمصلحة الأبحاث العلمية الزراعية (LARI).

جودة الهواء والضوضاء

لقد اخذت البيانات المتعلقة بجودة الهواء المحيطة بمنطقة المشروع من وزارة البيئة من خلال مشروع برنامج الأمم المتحدة الإنمائي. وقد أظهرت النتائج أن تركيزات ثاني أكسيد النيتروجين (NO₂) في جميع الخلايا متوافق مع المعايير الوطنية. أما فيما يتعلق بتركيزات PM₁₀ كانت القيم التي تم الحصول عليها متوافقة مع معايير منظمة الصحة العالمية الخاصة بنوعية الهواء. بينما PM_{2.5} لم تكن متوافقة مع معايير منظمة الصحة العالمية الخاصة بنوعية الهواء. وفيما يتعلق بمستوى الضوضاء في المنطقة، ونظرا لعدم توافر عن موقع المشروع، لوحظ خلال الزيارات الميدانية أن مستوى الضوضاء أعلى في المناطق المكتظة بالسكان.

غطاء الأرض

ان أكثر الأراضي شيوعا في المنية-الضنية هي الأراضي الزراعية والرعي. كما أنها ذات التضاريس الطبيعية والغطاء النباتي المتنوع كما على طول طريق L4-MD-RD4 المزروعة بأشجار السنديان والبلوط والسرو والتين وأنواع مختلفة من الأشجار المثمرة مثل أشجار الإجاص والتفاح على طول طريق L4-MD-RD6. يمثل الجدول التالي التصنيف البصري لاستخدام الأراضي استنادا إلى خرائط جوجل.

البلدية	غطاء الأرض
عزقي	كثافة سكانية منخفضة – ومناظر طبيعية كثيفة
بطرماز	كثافة سكانية منخفضة – وجود أراضي زراعية
بزال (قسم صغير) – عكار	كثافة سكانية متوسطة – وجود أراضي زراعية
دبعل	كثافة سكانية منخفضة – وجود أراضي زراعية
سير	مكتظة بالسكان
قطين	كثافة سكانية منخفضة – وجود أراضي زراعية

البلدية	غطاء الأرض
حازمية	كثافة سكانية منخفضة - وجود أراضي زراعية
عين التينة	كثافة سكانية منخفضة - وجود أراضي زراعية
قرصيتا (قسم صغير)	كثافة سكانية منخفضة - وجود أراضي زراعية
بيت الفقس	كثافة سكانية منخفضة - وجود أراضي زراعية
السفيرة	كثافة سكانية متوسطة - وجود أراضي زراعية

البيئة البيولوجية والمناطق الحساسة إيكولوجيا

المنية-الضنية غنية بالتنوع البيولوجي فهي موطن إحدى أشجار الصنوبريات دائمة الخضرة تدعى لزّاب أو العرعر التي تعتبر من تراث الغابات في هذه المنطقة. وأمّا الحيوانات في المنطقة فهي بشكل رئيسي الماشية والحيوانات البرية المختلفة مثل الثعالب والسناجب والقنفذ والضبع المخطط والخنزير البري.

يتضمن قضاء المنية-الضنية مرتفعات جبال عكار - الضنية التي أعلنت كمنطقة لتطوير المهمة (IBA). إلا أن أقرب طريق (L4-MD-RD4) يبعد حوالي ٤ كيلومترات عنها. أما بالنسبة للمناطق المحمية، فإن حرش إهدن هو أقرب محمية طبيعية لمنطقة المشروع، وهو على مسافة ٨ كيلومترات منها. وبالإضافة إلى ذلك، تخطط المنطقة لإنشاء منطقة محمية تحت اسم "محمية لزّاب الضنية الطبيعية"، حيث أصبحت هذه الشجرة نادرة في هذه المنطقة وهي شجرة مميزة من تراث غابات الضنية.

الديموغرافيا

يبلغ مجموع سكان شمال لبنان ٧٨١،٩٣٠ نسمة، ٢٨ في المائة منهم يعيشون في المنية - ضنية. وفي عام ٢٠١٦، بلغت الكثافة السكانية ١٦٩ نسمة لكل كلم^٢. تتميز الضنية بارتفاع كبير في النمو السكاني وفقاً لتقرير خطة التنمية الاستراتيجية الإقليمية لمنطقة الضنية. ويفسر حجم الأسرة الكبيرة في منطقة ضنية بارتفاع معدلات الخصوبة. ويبلغ متوسط عدد أفراد الأسرة ٤.٧ فرد مقابل ٣.٨ أعضاء على الصعيد الوطني. وتتميز منطقة الضنية بأنها منطقة شابة حيث أن ٤٢.٥ في المائة من مجموع السكان تقل أعمارهم عن ١٨ سنة، و ٧٠ في المائة من نسبة السكان تقل أعمارهم عن ٤٠ سنة. وبلغ العدد الإجمالي للاجئين المسجلين في منطقة المشروع ٦،٠٥٣ لاجئاً. وعلاوة على ذلك، يوجد ٤٤،٥٠٢ لاجئ فلسطيني في المنية الضنية. وتقدر نسبة البطالة في محافظة الشمال بـ ٨ في المائة، مقارنة بالمتوسط الوطني البالغ ٦.٤ في المائة. وقد شهد قضاة عكار/المنية - الضنية أعلى نسب الفقر الإجمالي.

الأنشطة الاقتصادية

يعتمد إقتصاد المنية - الضنية على قطاع الزراعة حيث يشكل هذا القطاع دخل ٩٠ في المائة من السكان الدائمين. غير أن سوء إدارة الموارد المائية واستخدام الأساليب الزراعية التقليدية والافتقار إلى الخبراء الزراعيين والصيدليات والمؤسسات البيطرية أدى إلى انخفاض في إجمالي المساحات الزراعية. وخلال زيارات موقع المشروع، تم تحديد مدرسة على طول طريق L4-MD-RD4 بالإضافة إلى مركز صحي وثلاثة مطاعم. أما بالنسبة إلى الطريق L4-MD-RD6، فأبرز ما تم رصده هي محلات صيانة السيارات والمحلات الصغيرة، ثلاثة مساجد، دكانة صغيرة، مخبز صغير، وموقع ترفيهي لمغارة الزحلان. وعلاوة على ذلك، تم رصد محطة للطاقة الكهرومائية على نهر الباراد (L4-MD-RD4).

قطاع التعليم

تتركز الأمية في فئات عمرية مرتفعة خاصة بين النساء. وعلاوة على ذلك، فإن مجموعة كبيرة من السكان (٤٢٪) قد حصلوا على تعليم ابتدائي ولم تصل هذه الفئة إلى مستويات تعليم متوسطة.

قطاع الرعاية الصحية

بالرغم من وجود العدد الكبير من المتخصصين والأطباء والمرضى في المنطقة، إلا أن القطاع الصحي في المنية الضنية غير قادر على تقديم الخدمات الطبية الأساسية للسكان. لذلك يميل سكان المنطقة وخصوصاً

الفقراء منهم إلى الاعتماد على العلاجات الطبية للصيدلة ولا يستشيرون المتخصصين الا في الحالات القصوى.

التراث الثقافي

بسبب آثارها التاريخية وثقافتها العديدة تبين ان المنية-الضنية كانت مسكونة منذ عصور ما قبل التاريخ. ولقد عملت الحقبان المملوكية والعثمانية على تشكيل هذه المنطقة بالمحددات الخاصة بها. غير أن الفريق لم يكتشف أيًا من هذه المواقع ذات الأهمية الأثرية أو الثقافية على طول الطرق.

ملخص الوضع الحالي

خلال زيارة موقع المشروع التي جرت في تشرين الثاني/نوفمبر ٢٠١٨ وكانون الأول/ديسمبر ٢٠١٩، تبين ان جميع المناطق الحساسة التي قد تتأثر نتيجة المشروع المقترح هي مراكز الرعاية الصحية والمراكز التعليمية. وتم تحديد جميع هذه المؤسسات والمراكز على طول الطرق المقترحة، وقد ورد ذلك بالتفصيل في التقرير.

موجز الآثار البيئية والاجتماعية المحتملة والتدابير التخفيفية خلال مرحلتى التأهيل والتشغيل

ملخص للآثار البيئية والاجتماعية والاقتصادية المحتملة والتدابير التخفيفية خلال مرحلة التأهيل:

مسؤولية التدابير التخفيفية	التدابير التخفيفية	الطبيعة	المستقبل	الآثار
البيئة				
المقاول	استخدام معدات خاضعة لصيانة بشكل صحيح الالتزام بخطة إدارة الغبار ري الأرض عندما تكون الرياح شديدة مزج المواد في أماكن مغلقة تغطية المواد عند النقل	سلبي	الهواء ، المجتمعات القريبة والعمال	تلوث الهواء الناجم عن انبعاثات الآلات أو الشاحنات أو أنشطة الاحتراق المفتوح
		سلبي	الهواء والمجتمعات القريبة	تلوث الغبار الناجم عن أنشطة إعادة التأهيل والحفر
المقاول	صيانة المركبات والآلات حصر الحفر وأي نشاط ضوضائي خلال ساعات العمل فقط حظر التخلص من النفايات الصلبة في المناطق المجاورة وتجنب ممارسة أي نشاط تأهيل خاصة بالقرب من محمية اللزّاب الطبيعية	سلبي	المجتمعات القريبة والعمال	تلوث الضوضاء الناجم عن نقل أو المواد الخام وحركة الشاحنات والحفر وتشغيل المركبات الثقيلة مثل الحفارات
المقاول	تركيب هياكل مؤقتة لمنع الجريان السطحي للمياه من الوصول إلى المياه السطحية القريبة تجنب العمل في الطقس الممطر شبكة مياه الصرف الناتجة عن العمال بشبكة الصرف الصحي أو بخزان البولي إيثيلين تصريف مياه الصرف الصحي المضخ من خزان البولي إيثيلين إلى محطات معالجة مياه الصرف الصحي القريبة منع تصريف مياه الصرف الصحي الى المياه السطحية القريبة تحت أي ظرف	سلبي	الموارد المائية والتربة والمجتمعات القريبة والمحلية	تلوث المياه السطحية من جراء التخلص غير السليم من مياه الصرف الصحي من العمال والمياه القادمة من تنظيف الآلات والمعدات انخفاض في نوعية المياه السطحية الإجمالية بسبب التخلص غير السليم من نفايات البناء تلوث المياه بسبب تسرب عرضي للزيوت والمواد الكيميائية
المقاول	التخلص السليم من مخلفات البناء إدارة النفايات بالممارسات المناسبة	سلبي	التربة وسطح التربة والأرض	تلوث التربة بسبب انسكاب الزيوت والمواد الكيميائية عن طريق الخطأ

مسؤولية التدابير التخفيفية	التدابير التخفيفية	الطبيعة	المستقبل	الآثار
	إعادة استخدام أو إعادة تدوير النفايات الناتجة كلما أمكن ذلك إعادة استخدام المواد المحفورة كلما أمكن ذلك التخلص من المواد المحفورة في المكبات الخاضعة للرقابة تدريب العمال على إجراءات تخفيف النفايات			من الآلات والشاحنات ونقل المواد الكيميائية والزيوت
المقاول	إعادة استخدام المواد المحفورة كلما أمكن ذلك التخلص من المواد المحفورة في المكبات الخاضعة للرقابة	سلبي	الموارد المائية	التخلص غير السليم من كميات الحفر يسبب تلوث المياه في الطقس الممطر
المقاول	التخلص السليم من مخلفات البناء إدارة النفايات بالممارسات المناسبة إعادة استخدام أو إعادة تدوير النفايات الناتجة كلما أمكن ذلك إعادة استخدام المواد المحفورة كلما أمكن ذلك التخلص من المواد المحفورة في المكبات الخاضعة للرقابة تدريب العمال على إجراءات تخفيف النفايات	سلبي	الموارد المائية والتربة وسطح التربة والأرض	تلوث المياه السطحية والتربة بسبب التخلص غير السليم من النفايات الصلبة الصادرة عن العمال والمواد المستعملة، ومخلفات البناء الناجمة عن أعمال الحفر
المقاول	صيانة المولدات والشاحنات اطفاء الأضواء في مكاتب الموقع أثناء الليل تدريب عمال البناء وتزويدهم بأوراق التوعية حول الاستخدام الفعال للطاقة إيقاف تشغيل الآلات والمعدات عند عدم استخدامها	سلبي	موارد الطاقة	ارتفاع معدلات إستهلاك الكهرباء مما يسهم في زيادة إستهلاك الوقود واستنفاده
المقاول	استخدام المياه بأكثر الطرق كفاءة والتقليل من هدرها	سلبي	الموارد المائية	ارتفاع معدلات إستهلاك المياه في الأنشطة المتصلة بإعادة التأهيل
المقاول	تأكد من استخراج مواد الخام من المواقع القانونية تجنب الأراضي الزراعية لاستخراج مواد الخام تخزين الطبقة العليا من التربة في حالة إجراء الاستخراج من مواقع زراعية لإعادة تأهيلها في المستقبل إعادة تأهيل الموقع الذي تم فيه التنقيب	سلبي	التربة وسطح التربة والأرض	إستخراج مواد الخام واستنفاد الموارد الطبيعية (الرمل، البحص، ...)
المقاول	صيانة المركبات والآلات حصار الحفر وأي نشاط ضوضائي خلال ساعات العمل فقط حظر التخلص من النفايات الصلبة في المناطق المجاورة وتجنب ممارسة أي نشاط للمشروع خاصة بالقرب من محمية اللزاب الطبيعية	محايد سلبي	التنوع البيولوجي والموائل الحساسة والمجتمعات القريبة والتنوع البيولوجي	تأثر الأشجار والنباتات بالقرب من الموقع أثناء أنشطة إعادة التأهيل انزعاج الحيوانات والسكان في المنطقة المجاورة من الضوضاء والنور والغبار
المقاول	تأكد من عدم حظر حركة المرور أثناء النقل	سلبي	المجتمعات القريبة	حوادث مرور أو إزدحام نتيجة سقوط مواد من المركبات أثناء النقل

الآثار	المستقبل	الطبيعة	التدابير التخفيفية	مسؤولية التدابير التخفيفية
			إعلام السكان ووضع لافتات بالقرب من مناطق التأهيل والعمل تغطية المواد المنقولة الالتزام بقواعد المرور تشغيل المركبات التي تتم صيانتها بشكل جيد	
الإصابات الناتجة عن حوادث السيارات بسبب وجود مواقع إعادة التأهيل وإغلاق بعض الطرق	المجتمعات القريبة	سلبي	تأمين حركة المرور عبر طرق بديلة للوصول إلى الوجهات ذات الصلة في حال استدعت أعمال التأهيل لإغلاق مؤقت لهذا الطريق إبلاغ المجتمع المحلي عن موقع الطرق المقفلة أو التحويلات من خلال الإعلانات العامة ولافتات التحويل المناسبة آلية مراعاة الشكاوى (GRM) للمجتمعات المحيطة	المقاول
اقتصادي و اجتماعي				
توفير فرص عمل للمجتمعات المحلية	تدفق العمالة والأنشطة الاجتماعية والاقتصادية	إيجابي	إعطاء أولوية التوظيف الى المجتمع المحلي المؤهل التسجيل اليومي للعمال والتحقق من سنهم لمنع عمل الأطفال آلية مراعاة الشكاوى (GRM) للمجتمعات المحلية	المقاول
استفادة محلات صيانة الاليات المحلية من صيانة المعدات و الشاحنات، و استفادة السكان من رسوم إيجار المكاتب وموقف المعدات و الشاحنات	المجتمعات المحلية القريبة والأنشطة الاجتماعية والاقتصادية	إيجابي	-	المقاول
التمييز من المجتمع المحلي ضد العمال الأجانب	العمال الأجانب	سلبي	تنظيم حملات توعوية للمجتمع المحلي بشأن تدفق العمال الأجانب أبلاغ المجتمع المحلي أن العامل سيوقع على شروط قواعد السلوك قبل ذكر العمل آلية مراعاة الشكاوى (GRM) للمجتمعات المحلية وجميع أصحاب المصلحة المعنيين	المقاول
توترات إجتماعية نتيجة تصور أن العمال الأجانب يحصلون على نسبة كبيرة من الوظائف التي خلقها المشروع	العمال المحليون والأجانب	سلبي	مسودة مدونات السلوك والمبادئ التوجيهية لخطة عمل للعنف القائم على النوع الاجتماعي (GBV) والعنف ضد الأطفال (VAC) على جميع العمال التوقيع على مدونات قواعد السلوك المكتوبة بلغتهم الأم الرد على حوادث الاستغلال الجنسي المبلغ عنها واعطائها الأولوية التدريب على الجوانب القائمة على نوع الجنس وآلية مراعاة الشكاوى (GRM) داخلية وخارجية	المقاول
عمالة الأطفال في أنشطة البناء	الأطفال المحليون والأجانب	سلبي جدا	التسجيلات اليومية للعمال والتحقق من سنهم لمنع عمل الأطفال الالتزام بقانون العمل	المقاول

مسؤولية التدابير التخفيفية	التدابير التخفيفية	الطبيعة	المستقبل	الآثار
	التأكد من أن المقاول على علم بالعقوبات التي يفرضها قانون العمل في حال عمل الأطفال إلزام المقاول بالتقيد الصارم بقانون العمل من خلال وثائق المناقصة التابعة لمجلس الإنماء والإعمار التي يجب أن تتضمن حظر عمل الأطفال			
المقاول	التأكد من عدم حظر حركة المرور أثناء النقل إعلام السكان ووضع لافتات بالقرب من مناطق العمل تغطية المواد المنقولة الالتزام بقواعد المرور تشغيل المركبات التي تتم صيانتها جيداً	سلبي	المجتمعات المحلية القريبة والأنشطة الاجتماعية والاقتصادية	إزدحام المرور في المناطق المعنية بسبب نقل مواد البناء والمواد التي قد تسقط أو بسبب الإغلاق المؤقت للطرق
المقاول	مسودة مدونات السلوك والمبادئ التوجيهية لخطة عمل للعنف القائم على النوع الاجتماعي (GBV) والعنف ضد الأطفال (VAC) على جميع العمال التوقيع على مدونات قواعد السلوك المكتوبة بلغتهم الأم الرد على حوادث الاستغلال الجنسي المبلغ عنها واعطائها الأولوية التدريب على الجوانب القائمة على نوع الجنس وآلية مراجعة الشكاوى (GRM) داخلية وخارجية	سلبي	المجتمعات القريبة	احتمال وقوع حوادث اعتداء واستغلال جنسي بسبب تدفق اليد العاملة
المقاول	تأمين حركة المرور عبر طرق بديلة للوصول إلى الوجهات ذات الصلة في حال استدعت أعمال التأهيل لإغلاق مؤقت لهذا الطريق إبلاغ المجتمع المحلي عن موقع الطرق المقفلة أو التحويلات من خلال الإعلانات العامة ولافتات التحويل المناسبة آلية مراجعة الشكاوى (GRM) للمجتمعات المحيطة	سلبي	المجتمعات المحلية القريبة والأنشطة الاجتماعية والاقتصادية	تعذر وصول المجتمع المحلي إلى الخدمات بسبب أنشطة إعادة التأهيل وإغلاق الطرق مؤقتاً
المقاول	تركيب هياكل مؤقتة (ألواح خشبية) من الطريق إلى المحلات التجارية ومدخل الموقع الترفيهي والمركز الطبي والمدرسة والمساجد تركيب لوحات الإشارات بشكل صحيح الانتهاء من مرحلة إعادة التأهيل في الوقت المناسب	سلبي	أصحاب المحلات والزائرين	تعذر دخول المحال التجارية والمواقع الترفيهية بسبب أعمال إعادة التأهيل وإغلاق الطريق مؤقتاً مما يؤثر على رزق أصحاب المحلات والزوار
الصحة والسلامة المهنية والمجتمعية				
المقاول	على العمال ارتداء معدات الحماية الشخصية (PPE) المناسبة وجود عدة الإسعافات الأولية (ثلاثة على الأقل) في موقع البناء إعلام السكان ووضع لافتات بالقرب من مناطق العمل	سلبي جدا	العمال المحليون والأجانب	الحوادث والإصابات التي تلحق بالعمال بسبب أنشطة البناء (المخاطر الصحية التنفسية بشكل رئيسي)
		سلبي	المجتمعات القريبة	توليد الغبار والضوضاء مسبب في مشاكل صحية للمقيمين القريبين

مسؤولية التدابير التخفيفية	التدابير التخفيفية	الطبيعة	المستقبل	الآثار
	الإدارة السليمة للشاحنات والآليات الثقيلة التي تدخل وتخرج من موقع البناء وضع خطة للصحة العامة والسلامة الخاصة بالموقع والصحة والسلامة المهنية تطبيق أفضل الممارسات المطبقة على السلامة على الطرق			

ملخص للآثار البيئية والاجتماعية والاقتصادية المحتملة والتدابير التخفيفية خلال مرحلة التشغيل:

مسؤولية التدابير التخفيفية	التدابير التخفيفية	الطبيعة	المستقبل	الآثار
البيئي				
السلطات المحلية	تأكد من صيانة الطريق بانتظام لضمان ظروف سطح جيدة إجراء مراقبة متكررة لجودة الهواء على طول منطقة الطرق للتأكد من أن جودة الهواء المحيط تقع ضمن المعايير	سلبى	الهواء، المجتمعات القريبة	زيادة مستويات تلوث الهواء في المنطقة مما يسبب مخاطر صحية عامة وآثار أخرى على البيئة
السلطات المحلية	تركيب لافتات بالقرب من المناطق الحساسة لمنع الناس من استخدام أبواق السيارات	سلبى	المجتمعات القريبة، التنوع البيولوجي والأماكن الحساسة	تلوث الضوضاء الناجم عن حركة المركبات وارتجاجاتها واستخدام الأبواق التي تزجج السكان في المناطق السكنية القريبة والحياة البرية
السلطات المحلية	تركيب إضاءة صديقة للبيئة لإضاءة الشوارع لتقليل استهلاك مصادر الطاقة غير المتجددة	سلبى	موارد الطاقة	استنفاد الموارد الطبيعية (الوقود) المستخدمة لإضاءة الشوارع
السلطات المحلية	وضع علامات تحديد السرعة وعلامات عبور الحيوانات في المناطق حيث تعبر الطرق	سلبى	التنوع البيولوجي والأماكن الحساسة	تعطيل حركة الحيوانات مما يؤدي إلى الموت المباشر أو تجنبها بسبب زيادة حركة مرور المركبات في المنطقة
السلطات المحلية	التأكد من صيانة الطريق بانتظام لضمان ظروف سطح جيدة	محايد	الموارد المائية والتربة وسطح التربة والأرض والمجتمعات القريبة	حوادث تسرب الزيوت و انتقالها عبر مياه الأمطار الى المياه السطحية والجوفية القريبة
		سلبى	الأنشطة الاجتماعية - الاقتصادية، المجتمعات القريبة	الحوادث السير الناجمة عن ازدياد حركة المركبات بسبب تحسن أحوال الطرق
اقتصادي واجتماعي				

-	-	اجباي جدا	الأنشطة الاجتماعية - الاقتصادية، المجتمعات القرية	تشجيع الفرص التجارية الجديدة والأنشطة التسويقية في المنطقة، وزيادة قيمة الأراضي وتيسير الحصول على الخدمات وتحسين مستويات المعيشة
-	-	اجباي	الأنشطة الاجتماعية - الاقتصادية، المجتمعات القرية	تحسن أحوال الطرق نتيجة تركيب علامات السلامة المناسبة
-	-	اجباي	الأنشطة الاجتماعية - الاقتصادية، المجتمعات القرية	تعزيز السياحة
الصحة والسلامة المهنية والمجتمعية				
السلطات المحلية	تطبيق أفضل الممارسات المطبقة على السلامة على الطرق	سلبي	المجتمعات المحلية والقرية	زيادة حركة المرور ومعدلات الحوادث والمخاطر على المشاة

خطة ادارة البيئة و المجتمع والاجراءات الاحترازية

اثناء التأهيل:

- إنشاء هياكل مؤقتة لمنع تسرب المياه الى المياه السطحية الجوفية وتجنب العمل في الجو الممطر.
- ضمان تركيب مرابض مؤقتة متصلة بشبكة الصرف الصحي او الى خزان مخصص إذا لم تكن شبكة الصرف الصحي موجودة
- التخلص من مياه الصرف الصحي المجمعة في خزان في محطات معالجة مياه الصرف الصحي القريبة
- منع تصريف مياه الصرف الصحي في المياه السطحية والجوفية القريبة
- صيانة المركبات والمعدات والآلات بشكل منتظمة
- منع حرق النفايات الصلبة
- تحرك المركبات والآلات بسرعة منخفضة على الطرقات غير المعبدة
- ينبغي ان يتم تحميل المواد الخام في إطار التدابير الوقائية من الغبار
- تغطية مناطق تخزين المواد الخام
- رش الماء من أجل إزالة الغبار
- تغطية المواد في المركبات والآلات عند نقلها
- صيانة جميع المعدات والآلات بشكل منتظمة
- حصر أنشطة الحفر خلال ساعات العمل
- حظر استخدام الآلات الثقيلة أثناء الليل
- تقليل هدر المياه كلما أمكن ذلك
- استخدام التنظيف الجاف بدلاً من التنظيف بالمياه
- تدريب وتوعية العمال فيما يتعلق بحفظ المياه
- لا ينبغي ان يأتراستخدام المياه في أنشطة اعادة التأهيل على وفرة المياه للمجتمعات المحلية القائمة
- يجب اطفاء الأضواء في المكاتب أثناء الليل
- عدم ترك الآلات والمعدات شغالة عندما لا تكون قيد الاستخدام
- تجنب الأراضي الزراعية من أجل استخراج المواد (رمال و بحص)
- ضمان استخراج المواد (رمال و بحص) من كسارات قانونية
- صيانة المركبات والآلات
- تقليل الضوضاء من خلال عزل الآلات
- إطفاء جميع مصادر الضوضاء أثناء الليل لتجنب الاضطرابات الناجمة عنها خلال الليلا

- الحفاظ على المساحات الخضراء كلما أمكن ذلك وعدم القيام بأي نشاط تابع للمشروع قرب المحمية الطبيعية لزأب الضنية والابتعاد قدر الامكان عنها ومنع رمي النفايات الصلبة في محيط تلك المنطقة
- تحذير الموظفين بدقة من المشاركة في أي أنشطة غير أخلاقية و الامتثال للمعايير الأخلاقية المحلية
- تحديد مواعيد لأنشطة اعادة التأهيل
- ضمان التخلص السليم من النفايات الصلبة والسائلة أو التخلص منها بطريقة صديقة للبيئة أوفي مناطق معينة
- تركيب هياكل للمرور من الطريق إلى المتاجر
- تركيب لوحات ارشادية
- إنجاز مرحلة إعادة التأهيل في الوقت المحدد
- ينبغي أن يوقع جميع العمال، بمن فيهم العمال الأجانب والمستشارون الدوليون، على شروط قواعد السلوك
- تقاضي الرواتب بالتساوي لجميع العمال (المحليين والأجانب والاختصاصيين وغير الاختصاصيين) وفقاً للأسعار السوق
- الالتزام بقانون العمل وضمان عدم مشاركة العمال الذين تقل أعمارهم عن ١٨ عاماً في أعمال اعادة التأهيل
- ضمان أن يكون المقاول على علم بالعقوبات التي يفرضها قانون العمل في حالة عمل الأطفال
- إلزام المقاول بالالتزام الصارم بقانون العمل الذي يشمل حظر عمل الأطفال
- تسجيل معلومات عن العمال والتحقق من أعمارهم لمنع عمل الأطفال
- جميع العمال ملزومين بمنع حالات الاعتداء والاستغلال الجنسي والإبلاغ عنها
- الاستجابة للحوادث المبلغ عنها على سبيل الأولوية
- تنظيم حملات توعية بشأن تدفق العمالة إلى المجتمع المحلي
- آلية مراعاة الشكاوى للمجتمعات المحلية بما في ذلك جميع أصحاب المصلحة المعنيين
- وضع علامات و لوحات ارشادية
- إعلام المجتمع المحلي بالطرق المغلقة أو تغيير مسارها من خلال الإعلانات العامة
- يجب وضع رجل حامل الراية على الطرق المقترحة لتحذير السيارات المارة وضمان عدم حظر حركة المرور
- التنسيق مع شرطة البلدية للمساعدة في إدارة السير
- حظر المركبات التي تنقل مواد البناء خلال النهار
- ارتداء معدات الحماية الشخصية
- الالتزام بجدول العمل المعين
- يجب وضع علامات السلامة و اللوحات الارشادية المناسبة في المناطق الحساسة داخل منطقة المشروع (أي بالقرب من المدارس)
- تدريب سائقي الآلات الثقيلة على السلامة على الطرق
- إبلاغ المجتمع المحلي بجدول أعمال اعادة التأهيل
- تركيب ممرات للمشاة والعربات بالقرب من المناطق السكنية
- وضع خطة للصحة العامة والسلامة الخاصة بالموقع والصحة والسلامة المهنيين
- تطبيق أفضل الممارسات المطبقة على السلامة على الطرق

أثناء التشغيل:

- المحافظة على نظام تجميع شبكات مياه العواصف خاصة قبل بدء موسم الأمطار
- القيام باستمرار بجمع النفايات الصلبة لمنع انسداد نظام الصرف
- ضمان الحفاظ على الطريق بانتظام لضمان ظروف سطحية جيدة
- إصلاح حدود السرعة على طول الطرق
- تركيب علامات الإنذار بشكل سليم بالقرب من المناطق الحساسة لمنع الناس من استخدام أبواق السيارات
- استخدام مصابيح الإضاءة الصديقة للبيئة في الشوارع
- استخدام تقنيات التنظيف الجاف

- تركيب علامات مثل علامات الحد من السرعة وعلامات عبور الحيوانات
- تطبيق أفضل الممارسات المطبقة على السلامة على الطرق

مشاورة العامة وإبلاغها وعرض النتائج

عقدت جلسة مشاركة عامة في اتحاد بلديات الضنية يوم الأربعاء، ١٦ تشرين الأول/أكتوبر ٢٠١٩. وكان الغرض من هذه الجلسة هو إبلاغ أصحاب المصلحة (بما في ذلك المنظمات غير الحكومية في منطقة المشروع)، بالمشروع المقترح لإعادة تأهيل طريقان في قضاء المنية-الضنية وما يصاحبها من أعمال أخرى، ومراجعة ملاحظاتهم. وشارك في الاجتماع ٢٠ شخصا، منهم ٤ نساء، إثنان منهن يعملن في اتحاد بلديات الضنية، واحدة هي رئيسة اتحاد شباب الضنية وأخرى هي محاسبة لجمعية تنموية. وخلال الجلسة، أعبّر الحضور عن مخاوف مختلفة وخاصة تلك المتعلقة باختيار الطرق وبالأخص طريق L4-MD-RD6. بالإضافة، ذكرت النساء اللواتي شاركن في جلسة مشاركة منفصلة أن المشروع سيسهم بشكل إيجابي في تحسين مشاركة المرأة في الاقتصاد بجعل النقل أكثر أمانا. لكنهن أشرن إلى ضرورة وجود آلية تنسيق واضحة مع البلديات والسلطات الأخرى خلال مرحلة إعادة التأهيل لمعالجة المشاكل المحتملة بسرعة وذكرن مثل انفجار المياه أو أنابيب الصرف الصحي.

وقد أجريت المشاورات مع المنظمات غير الحكومية على المستويين المحلي والدولي. على المستوى المحلي، تمت دعوة المنظمات الغير الحكومية الخاصة بكل قضاء إلى جلسة استماع عامة. على الصعيد الدولي، المنظمات الغير الحكومية التي تم الاتصال بها تغطي البلد بأكمله. إنها ANERA، ACTED والمجلس الدنماركي للاجئين (DRC). تم الاتصال بهذه المنظمات غير الحكومية الدولية لإبلاغها بالمشروع ونشره وطلبها تعميم آثاره وأنشطته على السوريين وإبلاغهم أنه يمكنهم الاستفسار عن معلومات إضافية أو تقديم شكوى (GRM). إن نشاط كل من المنظمات غير الحكومية المحلية والدولية المدعوة مذكور في هذا التقرير.

علاوة على ذلك، ستكون آلية مراعاة الشكاوى (GRM) متاحة لجميع أصحاب المصلحة المعنيين وكذلك للموظفين الداخليين، أي العمال في الموقع.

الخلاصة

معظم الآثار السلبية للمشروع يتوقع أن تحدث خلال مرحلة إعادة التأهيل. هذه الآثار تتعلق بإزعاج السكان القريبين من أنشطة إعادة التأهيل إلى جانب بعض الآثار على البيئة المحيطة، مثل تدهور نوعية التربة و المياه إذا لم تتم إدارة النفايات السائلة والنفايات الصلبة بشكل سليم. إضافة إلى ذلك فهناك أثر سلبي على نوعية الهواء نتيجة أعمال إعادة التأهيل خاصة عند إزالة الطبقات الإسفلتية المتدهور بالكامل و إعادة انشاءها من جديد. ومن ناحية أخرى سيتم توفير فرص العمل للمجتمع المحلي خلال مرحلة إعادة التأهيل التي تعتبر اثرا ايجابيا. و لكن تعتبر هذه الآثار قصيرة الأمد وستتقلص بمجرد انتهاء المشروع. أما الآثار الاجتماعية والاقتصادية التي تم تقييمها خلال مرحلة التشغيل فهي ايجابية في معظمها من حيث تحسين حركة المرور والسلامة العامة على الطرقات وتحسين الاحوال الاقتصادية في منطقة المشروع. لكن المشروع المقترح سيسهم على المدى الطويل في زيادة مستويات ملوثات الهواء في المنطقة فضلا عن الضوضاء المتصلة بحركة المرور التي تسبب مشاكل صحية عامة واثارا أخرى على البيئة. ومع ذلك، يمكن التقليل من الآثار البيئية السلبية التي قد تنشأ عن إعادة تأهيل الطرق المقترحة في قضاء المنية-الضنية بل وازالتها من خلال ممارسات خطة ادارة البيئة و المجتمع و الاجراءات الاحترازية المقترحة في التقرير.

1. INTRODUCTION

1.1 Project Background

The Council for Development and Reconstruction (CDR) acting as an executing agency on behalf of the Lebanese Council of Ministers (COM) awarded a contract to Associated Consulting Engineers (ACE), hereinafter the Consultant, to prepare the assessment, design and Environmental and Social Management Plans (ESMP) of Lot 4 under Roads and Employment Project (REP) – *See more about the Project in Section 3.*

The Roads and Employment Project is funded by the World Bank (WB). Its objectives are (1) to improve transport connectivity along select paved road sections and (2) to create short term jobs for Lebanese and Syrians. The project covers classified roads¹ in 25 Cazas² throughout Lebanon with an expected total length of 835 km and grouped in six (6) lots. The project will be implemented over a period of five years.

This report represents the ESMP of the REP in Minieh-Danniyeh Caza that is part of Lot 4.

1.2 Project Rationale

Lebanon has a total of around 8,000 km of roads along with a highway network linking the country with Syria (WFP, 2016). Despite this large road network coverage, a significant percentage of these roads is in poor condition. This situation hinders local and economic development mainly in rural and lagging regions, where the condition of the main network is worse than the national average. Moreover, this state has been aggravated by the influx of Syrian refugees which has significantly increased traffic and the utilization of the road network (CDR, 2018). As such, the proposed project aims to improve the efficiency of road sector expenditures through the prioritization of road works and the improvement of road asset management techniques (CDR, 2018).

The Project's main objectives are to enhance the transport connectivity along selected secondary and tertiary road sections in different cazas and to create short-term job opportunities for the Lebanese and Syrian communities. The project will include the rehabilitation of urban and rural stretches of roads from all Lebanese regions.

The specific objectives of the project are as follows:

- Providing road reconstruction/rehabilitation and road safety activities such as pavement structure, retaining walls, drainage systems, edge safety barriers, marking and traffic signing;
- Creating job opportunities for the local community by engaging them in several construction activities;
- Promoting gender workforce equality to the extent possible through encouragement of employment of both genders within the project.

¹Classified roads are based on the official Ministry of Public Works road classification which classifies the roads in Lebanon as primary, secondary or tertiary.

²Lebanon is divided administratively into three levels: Governorates (محاافظات), cazas or districts (أقضية), and municipalities (بلديات). There are eight governorates, 26 districts, and 1,029 municipalities in the country (as of the 2016 municipal elections).

1.3 Report Objectives

Pursuant to the World Bank OP 4.01 (Environmental Assessment), this ESMP report seeks to satisfy the following objectives:

- Describe all components of the proposed project;
- Identify relevant environmental and social national, international and WB policies and regulations;
- Conduct public consultation to identify public concerns regarding the project and to feed into project design to the extent possible;
- Describe baseline environmental and socio-economic conditions within the study area;
- Identify the significant positive and negative environmental and social impacts associated with the construction and implementation of the proposed project;
- Propose mitigation / enhancement measures for the identified impact whenever possible;
- Facilitate informed decision making, including setting the environmental terms and conditions for implementing the proposed project;
- Develop a plan to monitor the identified impacts and their associated mitigation measures;
- Develop an institutional setup along with capacity building requirements.

It is worth mentioning here that Decree No. 8633/2012 about Fundamentals of Environmental Impact Assessment (EIA) is not relevant to the Project since this latter is not categorized under either Annex I or II of the EIA Decree.

1.4 Methodology

This ESMP of the REP in Minieh-Danniyeh Caza that is part of Lot 4 was prepared to cover all components of the proposed project during the rehabilitation and operation phases, to assess the likely environmental and social consequences of a project, and to determine the necessary measures to mitigate the negative ones and increase the positive impact on the environment. As such, the task was initiated by conducting site visits and a literature review in order to determine the current environmental and social conditions (such as hydro-geological and groundwater quality, air meteorological data, biological and socio-economic conditions, and cultural heritage sites), along with relevant local and WB legislations, guidelines, and standards. The review also included the identification and assessment of the suggested alternatives to the project.

In addition, the environmental team communicated closely with the technical team in order to obtain the necessary information on both the status of each road, as well as the proposed rehabilitation activities, thus describing the proposed project in a thorough manner. In terms of the assessment, negative and positive impacts were identified and mitigation measures were proposed to address the negative ones. As such, an ESMP was developed and included a monitoring plan, which is needed to ensure compliance of the project with environmental and social conditions and regulations.

Furthermore, the scope of work included also the development of an institutional setup to ensure that the project implementers have sufficient technical and human resources available to effectively undertake the environmental management and monitoring tasks. As for the participation of the public and concerned communities, this was done through

conducting a public hearing in a central location and invited all stakeholders and local community to participate.

2. EXISTING, LEGAL, ADMINISTRATIVE AND POLICIES FRAMEWORK

2.1 National Environmental and Social Legal Framework

The rehabilitation of roads involves a variety of activities that need to abide by national legislations that are enforced by various government institutions. Table 2-1 describes a legal framework governing the REP for Lot 4 in Minieh-Danniyeh, taking into consideration that no land acquisition or expropriation will be required during its implementation.

Table 2-1: National Legal Framework related to Project

Year	Law ³ / Decree ⁴ / Decision ⁵	Title	Relevant Provisions
Labor			
1946	Labor Law	The Lebanese Labor Code	The Labor Law covers the industrial accident prevention and compensation. It regulates the minimum wage, the minimum age of employment based on their ages and the workplaces, resting periods and vacations for adolescent workers. It also sets the working hours, and the penal code regulation of strikes and lock out in essential employments
2001	Law No. 335	Pursuant to International Labor Organization (ILO) Convention No 128	This ratified convention addresses the minimum age of employment
2002	Law No. 400	Pursuant to the ILO Convention No 138	Elimination of the worst form of child labor
2012	Decree 8987	Prohibition of employment of minors under the age of 18 in work that may harm their health, safety or morals	This Decree restrict the employment of minors under the age of 18 in activities and works that can be harmful to their health, morals and that can limit their education
2016	Decree 3791	Minimum Wage	Raises the minimum daily wage to 20\$/day
Environment			
1933	Decree 2761	The prohibition of wastewater discharge into water streams	States the characteristics of channels and reservoirs where wastewater is discharged. In addition to the prohibition of its discharged into natural environment
1974	Decree 8735	Conservation of Public Hygiene	Solid waste management including collection and disposal is under the control of the municipality. It restricts dumping of wastes in public or private lands adjacent to roads and residential districts
1996	Law 558	Protection of forests	Classifies protected forests and defines the prohibited activities and works into the mentioned forests. It also contains offences and penalties.

³Lebanon's legislative body is represented by the Lebanese Parliament that approves and issues Laws.

⁴Lebanon's executive body is represented by the Council of Ministers (COM) and is headed by the Presidency of the Council of Ministers. The COM enacts regulations in the form of Decisions (denoted COM Decision Number) and Decrees.

⁵Decisions are issued by a specific minister and are limited to the affairs of the ministry that promulgated it. Ministerial Decisions are subject specific.

Year	Law ³ / Decree ⁴ / Decision ⁵	Title	Relevant Provisions
1996	MOE Decision 52/1	Requirements to protect air, water, and soil pollution	Allowable noise level according to type of areas and the permissible duration of exposure
2001	MOE Decision 8/1	Revised standards for air emissions, liquid effluents and wastewater treatment plants	The decision sets limits for discharge of wastewater into water bodies
2002	Law 444	Framework Law for Environmental Protection	Protect the national environment against all forms of degradation, air and water and soil pollution, and the promotion of sustainable use of natural resources and conservation of biodiversity
2002	Decree 8803/2002 and its amendments	Organizes the activity of quarries and crushers, licensing procedures, as well as the operation, management and rehabilitation of quarries.	Ensures the provision of construction material and the disposal of construction waste comply with the decree
2018	Law 77	Water Law	Tackles protection of water resources from pollution and management and monitoring of public wastewater treatment facilities
2018	Law 78	Air Quality Law	The investment in any facility or establishment that emanate foul or toxic odors should abide by the different environmental conditions issued by a decision from MOE
2018	Law 80	Integrated Solid Waste Management	Covers the management of non-hazardous and hazardous waste, and responsibilities and penalties related to violations of waste management laws
Health and Safety			
1988	Law 64	Protection of the environment against pollution from hazardous waste disposal and substances	Solid, liquid and gaseous wastes that may cause detriment to man, soil, fauna and flora or that may pollute the air or water should be suitably treated
2008	Decree 11802	Occupational prevention, safety, and health in all enterprises subject to the Code of Labor	Provides the general regulations for the prevention of occupational hazards and accidents, and the promotion of health and safety in all industrial establishments subject to the Labor Law. These cover prevention and safety, occupational health, the safe use of chemicals at work, as well as occupational noise standards
Cultural and Municipal			
1933	Decree law 166	Antiquity law	Defines chance find procedures that should be followed in case antiquities were identified in the project site
1977	Decree-Law 118	Municipal Act	Defining the responsibilities of municipalities
2008	Law 37	Cultural Policy Law	Any archaeological artefact located in Lebanon and deemed to be of historical, artistic, architectural or anthropological significance by the Ministry of Culture must be protected
Traffic			

Year	Law ³ / Decree ⁴ / Decision ⁵	Title	Relevant Provisions
2012	Law 243	New Traffic Law	Provide general driving rules and defines the penalties upon violation of the law
General			
1943	Legislative Decree 340	Penal Code	The law defines the type of crimes such as rape; lewd acts by threat, violence, or against minors; and other similar crimes. It also states punishments and legality of penalties
1991	Law 58	Expropriation law	States general and specific provisions for land acquisition. Also is includes improvement tax resulting from the implementation of public works
2017	Law 53	Amendment of Penal Code	Under sexual violence Article 522 of the Penal Code exonerated a perpetrator of kidnapping and adultery who married his victim. This was repealed in this law

In terms of the national legal requirements for speed limits, Lebanon uses the American Association of State Highway and Transportation Officials (AASHTO) 7th edition “Policy on Geometric Design of Highways and Streets” of 2018, which leaves designers to select the design speed which is appropriate for the roadway and correlate the various features of the design. The selected design speed should realistically represent actual or anticipated operating speeds and conditions on the roadway being designed or studied.

2.2 Institutional

Numerous governmental public institutions will be involved in the different stages of the ESMP of the REP. They are described in Table 2-2, along with their mandate and relevant responsibilities.

Table 2-2: Relevant Institutions

Institution	Main Role	Relevant Role
Council for Development & Reconstruction (CDR)	Securing funding for projects, allocating funds to different government agencies, supervising the execution of plans and contributing to the rehabilitation of public institutions	Securing funds for rehabilitation of road networks, issuing invitations for tenders and awarding construction contracts
Ministry of Public Works and Transportation (MOPWT)	Management of all public roads, for developing a sustainable strategy for the transportation sector, road and street plans within cities and villages	Under the MOPWT, the Directorate General of Roads and Buildings is in charge of the design, execution and maintenance of roads, bridges, walls and water channels. It is responsible for land use planning and cleaning the sides of the roads from wastes
Ministry of Environment (MOE)	Safeguard natural and environmental resources in Lebanon	Setting regulations and standards, and approving implementation and the development of projects sustainably
Ministry of Agriculture (MOA)	The Forestry and Natural Resources Administration of MOA is responsible for constructing public parks and afforestation work in all state lands including communal and private lands. Providing assistance for the implementation of afforestation and reforestation and soil conservation,	Under decision 476/1 dated 2012 gives permissions for cutting trees for rehabilitation purposes

Institution	Main Role	Relevant Role
	water conservation and the investment in public and forests	
Ministry of Labor (MOL)	Responsible for all labor issues. It prepares, coordinates and executes legislations in the labor, trade union and social fields	Responsible for ensuring that the labor law is applied for all workers present on the working sites
Ministry of Interior and Municipalities (MOIM) / Municipalities	The MOIM is responsible for internal policy affairs and maintenance of the system and security, supervises governorates affairs, villages, districts, electors, elective councils, municipalities and municipal federations, parties and associations. The municipalities and the Union of municipalities represent the level of local government with legal status, financial and administrative independence, which exercises powers and responsibilities over the territory it is granted by law	The MOIM is responsible for law enforcement and stopping infractions and violations and oversees the affairs and operations of local authorities. On the other hand, responsibilities of municipalities include general programs of works, cleanliness, health, water, lighting projects, the implementation, rectifying and enlarging of roads, transportation organizing. In addition, it includes preparation of general plans related to sanitary projects, maintenance of infrastructure including wastewater networks, as well as working for the protection of the environment
Ministry of Culture (MOC)	Responsible for the protection of heritage, antiquities, arts, literature, cultural industries and historical property in Lebanon.	Any artefacts of potential historical importance that can be found on a rehabilitation site fall under the jurisdiction of the Directorate General of Antiquities at the MOC

In addition to the national public institutions, the local community represented by the Non-Governmental Organizations (NGOs) were consulted (refer to Table 8-1 and Table 8-2 in Section 8.1).

2.3 Environmental Standards

2.3.1 Wastewater Discharge Targets

Table 2-3 represents the allowable contaminants concentration for wastewater when discharged into the surface water bodies, sea, or wastewater network according to the MOE decision 8/1 dated 30/1/2001.

Table 2-3: Limits for Wastewater Discharge into Receiving Water Bodies (MOE Decision 8/1)

Parameter	Discharge into Public Sewer	Discharge into Surface Water Bodies	Discharge into the Sea
Color	non	non	non
pH	6-9	6-9	6-9
Temperature	350C	300C	350C
BOD (5 day 20°C)	125 mg/l	25 mg/l	25 mg/l
COD (dichromate)	500 mg/l	125 mg/l	125 mg/l
Total Phosphorus	10 mg/l	10 mg/l	10 mg/l

Parameter	Discharge into Public Sewer	Discharge into Surface Water Bodies	Discharge into the Sea
Total Nitrogen ⁶	60 mg/l	30 mg/l	30 mg/l
Suspended solids	600 mg/l	60 mg/l	60 mg/l
AOX	5	5	5
Detergents	-	3 mg/l	3 mg/l
Coliform Bacteria 370 C in 100 ml ⁷	-	2,000	2,000
Salmonellae	Absence	Absence	Absence
Hydrocarbons	20 mg/l	20 mg/l	20 mg/l
Phenol Index	5 mg/l	0.3 mg/l	0.3 mg/l
Oil and grease	50 mg/l	30 mg/l	30 mg/l
Total Organic Carbon (TOC)	750 mg/l	75 mg/l	75 mg/l
Ammonia (NH ₄ ⁺)	-	10 mg/l	10 mg/l
Silver (Ag)	0.1 mg/l	0.1 mg/l	0.1 mg/l
Aluminum (Al)	10 mg/l	10 mg/l	10 mg/l
Arsenic (As)	0.1 mg/l	0.1 mg/l	0.1 mg/l
Barium (Ba)	2 mg/l	2 mg/l	2 mg/l
Cadmium (Cd)	0.2 mg/l	0.2 mg/l	0.2 mg/l
Cobalt (Co)	1 mg/l	0.5 mg/l	0.5 mg/l
Chromium total (Cr)	2 mg/l	2 mg/l	2 mg/l
Hexavalent Chromium (Cr VI ⁺)	0.2 mg/l	0.2 mg/l	0.2 mg/l
Copper total (Cu)	1 mg/l	0.5 mg/l	1.5 mg/l
Iron total (Fe)	5 mg/l	5 mg/l	5 mg/l
Mercury total (Hg)	0.05 mg/l	0.05 mg/l	0.05 mg/l
Manganese (Mn)	1 mg/l	1 mg/l	1 mg/l
Nickel total [Ni]	2 mg/l	0.5 mg/l	0.5 mg/l
Lead total (Pb)	1 mg/l	0.5 mg/l	0.5 mg/l
Antimony (Sb)	0.3 mg/l	0.3 mg/l	0.3 mg/l
Tin total (Sn)	2 mg/l	2 mg/l	2 mg/l
Zinc total (Zn)	10 mg/l	5 mg/l	5 mg/l
Active (Cl ₂)	-	1 mg/l	1 mg/l
Cyanides (CN ⁺)	1 mg/l	0.1 mg/l	0.1 mg/l
Fluorides (F)	15 mg/l	25 mg/l	25 mg/l
Nitrate (NO ₃ ⁻)	-	90 mg/l	90 mg/l

⁶ Sum of Kjeldahl-N (organic N + NH₃).NO₃-N. NO₂-N

⁷ For discharges in close distance to bathing water stricter environmental limit value could be necessary

Parameter	Discharge into Public Sewer	Discharge into Surface Water Bodies	Discharge into the Sea
Phosphate (POP43-)	-	5 mg/l	5 mg/l
Sulphate (SO42-)	1,000 mg/l	1,000 mg/l	1,000 mg/l
Sulphide (S2-)	1 mg/l	1 mg/l	1 mg/l

2.3.2 Air Emissions Targets

MOE Decision No. 52/1 of 1996 covers the National Ambient Air Quality Standards (NAAQS) for Lebanon and is presented in Table 2-4.

Table 2-4: NAAQS of MOE Decision 52/1-1996

Parameters	NAAQS Maximum Levels ($\mu\text{G}/\text{M}^3$)
Nitrogen dioxide (NO ₂)	200 (1 hr) 150 (24 hrs) 100 (Annual)
Carbon Monoxide (CO)	30,000 (1 hr) 10,000 (8 hrs)
Ground-level Ozone (O ₃)	150 (1 hr) 100 (8 hrs)
Total Suspended Particles(TSP)	120 (24 hrs)
PM ₁₀	80 (24 hrs)
PM _{2.5}	NA
Lead	1 (annual)
Benzene	16.2 (annual)

2.3.3 Noise Emissions Targets

Article 46 of Law 444 recognizes that loud noises, particularly noises caused from machinery and vehicles, may be harmful to human health and the environment. According to MOE decision 52/1 for 1996, noise pollution levels should not exceed the following listed limits in different workplace locations (Table 2-5).

Table 2-5: Permissible Noise Levels in Various Areas

Type of Area	Noise Limit (dB)		
	Day (7 am – 6 pm)	Evening (6 pm – 10 pm)	Night (10 pm – 7am)
Administrative and commercial area in the City Center	55-65	50-60	45-50
Residential Area with some commercial areas or along main road	50-60	45-55	40-50
Residential Areas in the City	45-55	40-50	35-45
City Suburbs	40-50	35-45	30-40
Rural Areas, hospitals, and gardens	35-45	30-40	25-35
Industrial Areas	60-70	55-65	50-60

Table 2-6 contains the hours of work permitted under various noise levels over 90 dB.

Table 2-6: Hours of Work Permitted under Noise Level

Noise Level (dB)	95	100	105	110	115
Hours permitted to work	4	3	1	0.5	0.25

2.4 Word Bank Policies

The Project activities should comply with the safeguards operational policies and procedures of the World Bank– specifically OP/BP 4.01 on Environmental Assessment and OP/BP 4.12 on Involuntary Resettlement.

The objective of OP/BP 4.01 is to identify, prevent, and mitigate the potential adverse environmental and social impacts associated with the implementation of a proposed project. In the World Bank operations, the Environmental Assessment (EA) is conducted in an effort to improve decision making, ensure that proposed project is environmentally sustainable, and that affected communities have been properly consulted. Moreover, the Bank classifies the proposed project into three main categories. The classification is based on the location, type, sensitivity, and scale of the project as well as the nature and significance of its environmental impacts. These categories are as follows:

- Category “A”: Significant negative environmental impacts are likely to occur as a result of implementing the proposed project. These impacts might affect an area broader than the project sites.
- Category “B”: Potential environmental impacts are less adverse than those of Category “A” projects. These impacts occur within the project site and proposed mitigation measures can be designed and implemented more readily than Category “A” projects. As such, a preliminary EIA must be prepared.
- Category “C”: Minimal or no negative environmental impacts are likely to occur as a result of implementing the proposed project. As such, an EIA is not required in this case.

Since the project activities are focused mainly on road maintenance and rehabilitation activities, thus the majority of impacts are expected to be localized and temporary. As such, this project falls under Category “B”.

Under OP/BP 4.12 on Involuntary Resettlement, involuntary displacement does not cover only the physical displacement such as the relocation or loss of home but also the economic displacement that includes loss of access to natural resources or restrictions on land use. The policy aims to avoid involuntary resettlement to the extent possible or to minimize the negative socioeconomic impacts that might affect the targeted community. Moreover, resettlement should be done in a sustainable way when its avoidance is not feasible. This policy also requires the borrower to prepare a suitable resettlement planning instruments prior to Bank assessment of the proposed project. However, no involuntary resettlement or land acquisition will take place in the proposed project in Minieh-Danniyeh Caza.

2.4.1 Public Consultation and Disclosure Policy

According to OP/BP 4.01, the Bank requires that a public consultation with project-affected people and local nongovernmental organizations (NGOs) must be conducted for all projects under Category A and Category B. The aim of the consultation is to present to the public the

components of the project along with potential environmental and social impacts and takes their comments and concerns into consideration (see more details about Project Public Consultation in Section 8.1.1). Under Category B projects, it is required to conduct at least one formal public consultation which is usually done during the ESMP draft stage. Moreover, during the implementation of the proposed project, the borrower has to consult with such affected and interested groups in order to address any environmental or social issue that may arise.

In an effort to make the public consultation as significant and meaningful as possible, the consultant should provide relevant data on the proposed project to the public before the consultation session and in a form and language that are clear and accessible to the targeted groups. Information that must be included during the public consultation session includes a brief on the proposed project's objectives, general description, and potential environmental and social impacts during all project phases. Finally, once the borrower officially submits the ESMP report to the Bank, the Bank makes the report available to the public through the Bank's external website and through the government counterpart, which in this case is CDR.

2.4.2 Guidelines and Manuals

The World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines are mandatory and need to be adopted throughout the project duration. In addition, the WB has developed guidelines and manuals that need to be adopted during the ESMP implementation phase of the project. These guidelines and manuals include technical reference documents with general and sector-specific examples of good practices during all phases of the proposed project. Guidelines and manuals include:

- WBG Environmental, Health and Safety (EHS) Guidelines Disclosure Handbook.
- The World Bank Participation Sourcebook.
- Roads and the Environment. A Handbook. World Bank Technical Paper.
- Doing Better Business through Effective Public Consultation and Disclosure – A good Practice Manual, issued by IFC.
- Good Practice note addressing Gender Based Violence in Investment Project Financing involving Major Civil Works.

2.5 International Treaties and Conventions

Table 2-7 presents the international conventions that Lebanon is a signatory to whose provisions may be relevant to the project.

Table 2-7: Relevant International Treaties and Conventions

Convention	Ratification	Description
United Nations Framework Convention on Climate Change (UNFCCC) - 1992	Ratified through Law No. 359 (1994)	The main objective of the UNFCCC is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". In addition, the executive secretary emphasizes the importance of agriculture and land use in the fight against climate change. The Project must control activities that release green-house gases.

Convention	Ratification	Description
Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) - 1979	Ratified by Lebanon in 1997 with reservations	Aims to eliminate discrimination against women in the field of employment and other areas of economic and social life in order to ensure, on a basis of equality of men and women, the same rights. The convention also requires taking into account the particular problems faced by rural women and the significant roles which rural women play in the economic survival of their families.
Convention on Biological Diversity (CBD) - 1992	Ratified through Law No. 360 (1/8/1994)	The CBD develops strategies in order to conserve biodiversity, ensure the sustainable use of its components and the fair and equitable sharing of benefits arising from genetic resources.
International Labor Conventions: Convention 120 concerning Hygiene in Commerce and Offices Convention 136 concerning Protection against Hazards of Poisoning Arising from Benzene Convention 139 concerning Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents	Ratified by Lebanon in 1977 Ratified by Lebanon in 2000 Ratified by Lebanon in 2000	This Convention protects workers health and ensures proper sanitation and hygiene.

2.6 Environmental Health and Safety (EHS) Guidelines of the WB/International Finance Corporation

2.6.1 Wastewater and Ambient Water Quality

Table 2-8 shows the EHS guidelines for treated sanitary sewage discharges into surface water bodies that are adopted by the IFC of the World Bank Group in the Environmental, Health, and Safety Guidelines for environmental wastewater and ambient water quality (WBG-IFC, 2007) and the allowable contaminants concentration for wastewater when discharged into the surface water bodies according to the MOE decision 8/1 dated 30/1/2001.

Table 2-8: EHS and National wastewater effluent quality for the discharge into surface water bodies

Pollutant	EHS guidelines for treated sanitary sewage discharges	National discharge to surface water bodies decision 8/1
pH	6-9	5-9
BOD	30 mg/L	100 mg/L
COD	125 mg/L	250 mg/L
TN	10 mg/L	30 mg/L
TP	2 mg/L	10 mg/L
Oil and Grease	10 mg/L	30 mg/L
TSS	50 mg/L	200 mg/L

Pollutant	EHS guidelines for treated sanitary sewage discharges	National discharge to surface water bodies decision 8/1
Total coliform bacteria	400	-

Source: EHS 2007 and MOE Decision 8/1 for 2001

2.6.2 Air Emissions and Ambient Air Quality

Table 2-9 shows the WHO Ambient Air Quality Guidelines (WHO, 2005) that are adopted by the IFC of the World Bank Group in the Environmental, Health, and Safety Guidelines of Air Emissions and Ambient Air Quality and the NAAQS of MOE Decision 52/1-1996. As can be noted from comparison of these levels, the NAAQS maximum levels of the ambient air quality are much higher for several pollutants comparing to the same pollutants of the WHO. These elements are SO₂, NO₂, PM10, Lead and Benzene. However, the other pollutants have similar values. Therefore, for this project, the WHO standards apply.

Table 2-9: WHO Guidelines for Ambient Air Quality of 2005 and NAAQS of MOE Decision 52/1-1996

Parameters	WHO Guidelines (µG/M ³)	NAAQS Maximum Levels (µG/M ³)
Sulfur dioxide (SO ₂)	500 (10 minutes) 20 (24 hrs)	-
Nitrogen dioxide (NO ₂)	200(1 hr) 40(Annual)	200 (1 hr) 150 (24 hrs) 100 (Annual)
Carbon Monoxide (CO)	30,000 (1 hr) 10,000 (8 hrs)	30,000 (1 hr) 10,000 (8 hrs)
Ground-level Ozone (O ₃)	100 (8 hrs)	150 (1 hr) 100 (8 hrs)
Total Suspended Particles (TSP)	150 (24 hrs)	120 (24 hrs)
PM10	50 (24 hrs) 20 (Annual)	80 (24 hrs)
PM2.5	25 (24 hrs) 10 (Annual)	NA
Lead	0.5 (annual)	1 (annual)
Benzene	Unit Risk Life 6.10 ⁻⁶	16.2 (annual)

Source: WHO 2005 and MOE Decision 52/1-1996

2.6.3 Noise Management

Table 2-10 shows the noise level guidelines according to the EHS Guidelines. Comparing these levels with the national one, although some characteristics differ for WHO in reference to the type of area and the day hours that extend to 10 pm instead of 6 pm for the national standards, the noise limits for residential, institutional, and educational areas by the WHO are more stringent and therefore apply. Noise limits for Industrial and commercial areas are more stringent in the national standards.

Table 2-10: WHO Noise Level Guidelines Compared to National Levels

Type of Area	WHO Noise Level (dB)		Noise Standards as per MOE Decision 52/1-1996		
	Day (7 am – 10 pm)	Night (10 pm – 7 am)	Day (7 am- 6 pm)	Evening (6 pm – 10 pm)	Night (10 pm – 7 am)

Residential	55	45	45-55	40-50	35-45
Institutional	55	45	-	-	-
Educational	55	45	55-65	50-60	45-50
Industrial	70	70	60-70	55-65	50-60
Commercial	70	70	55-65	50-60	45-50

3. DESCRIPTION OF THE PROPOSED PROJECT

3.1 Location

The study area where the proposed roads are located is in the Caza of Minieh-Danniyeh of North Lebanon Governorate. The total number of the proposed roads to be rehabilitated under this project is two roads with a total length of 15.5 km. All of the roads are already existing and need rehabilitation works. The length of each road along with the municipalities that it passes through is presented in the table below (Table 3-1).

An overview of the proposed roads locations is presented in Figure 3-1 and Figure 3-2 while the location of each of the project roads are represented in the maps illustrated in Figure 3-3 and Figure 3-4.

Table 3-1: Proposed Roads within the Caza of Minieh-Danniyeh (Road 4 and 6)

	Road Code	Road Name	Alignment Name[1]	Classification	Municipalities	Length (m)	Average Width (m)
Lot 4– Minieh Danniyeh Caza (L4-MD)	Road 6	Sir El Danniyeh - Qattine - Hazmieh - Ain El Tineh - Beit El Faqs - Sfireh	L4-MD-RD6	Secondary	Sir Kattiné Qraine El Hazmieh Ain El Tiné Karseita (small part) Beit El Faks Al-Sfiré	8,170	6
	Road 4	Debaal-Aioun al Samak	L4-MD-RD4	Tertiary	Azka Btermaz Bzal (small part) - Akkar Debaael	7,400	5
					Total Length (m)	15,570 m	-

[1] The code for the roads represents the road label for example for L4–MD–RD6: L4=Lot No.4 (Lot Number as per Contract), MD=Minieh-Danniyeh (Name of Caza as per Contract), RD6=Road label (as per Contract).

Figure 3-1: Overview of Location of Road L4-MD-RD 4 in Minieh-Danniyeh Caza

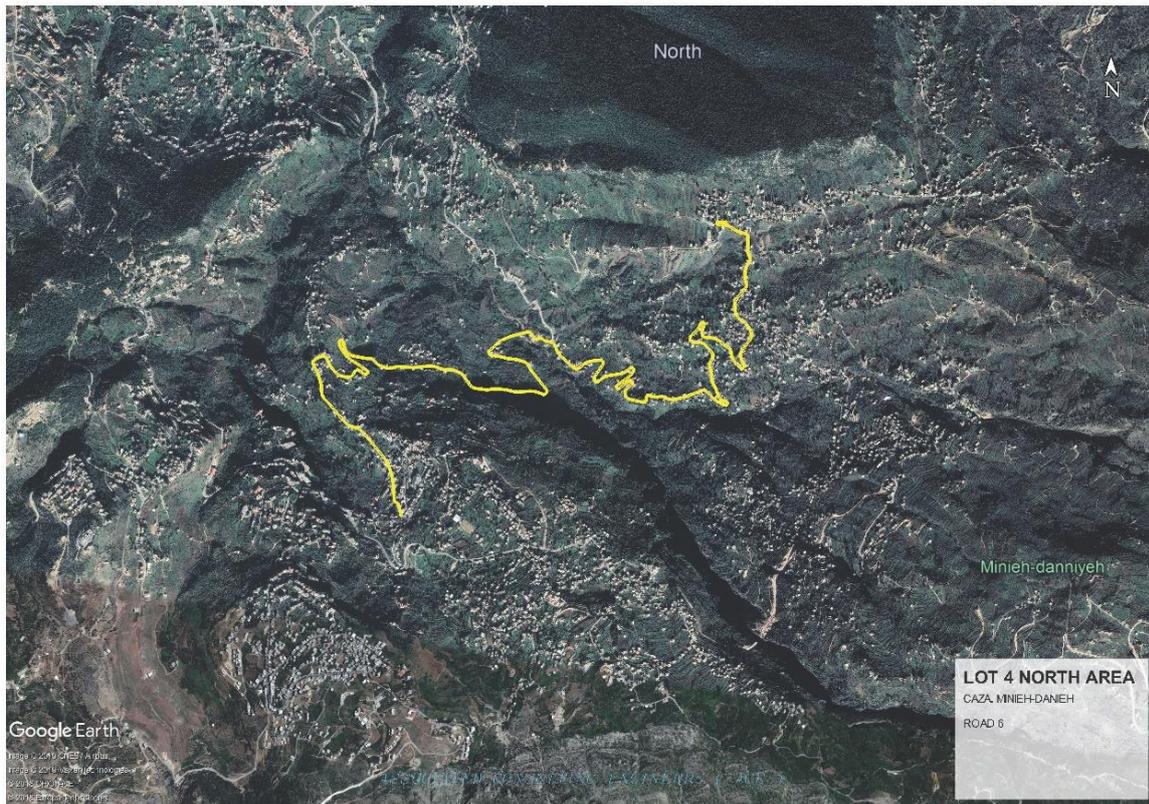


Source: Google Earth, 2019



Source: ACE

Figure 3-2: Overview of Location of Road L4-MD-RD 6 in Minieh-Danniyeh Caza



Source: Google Earth, 2019



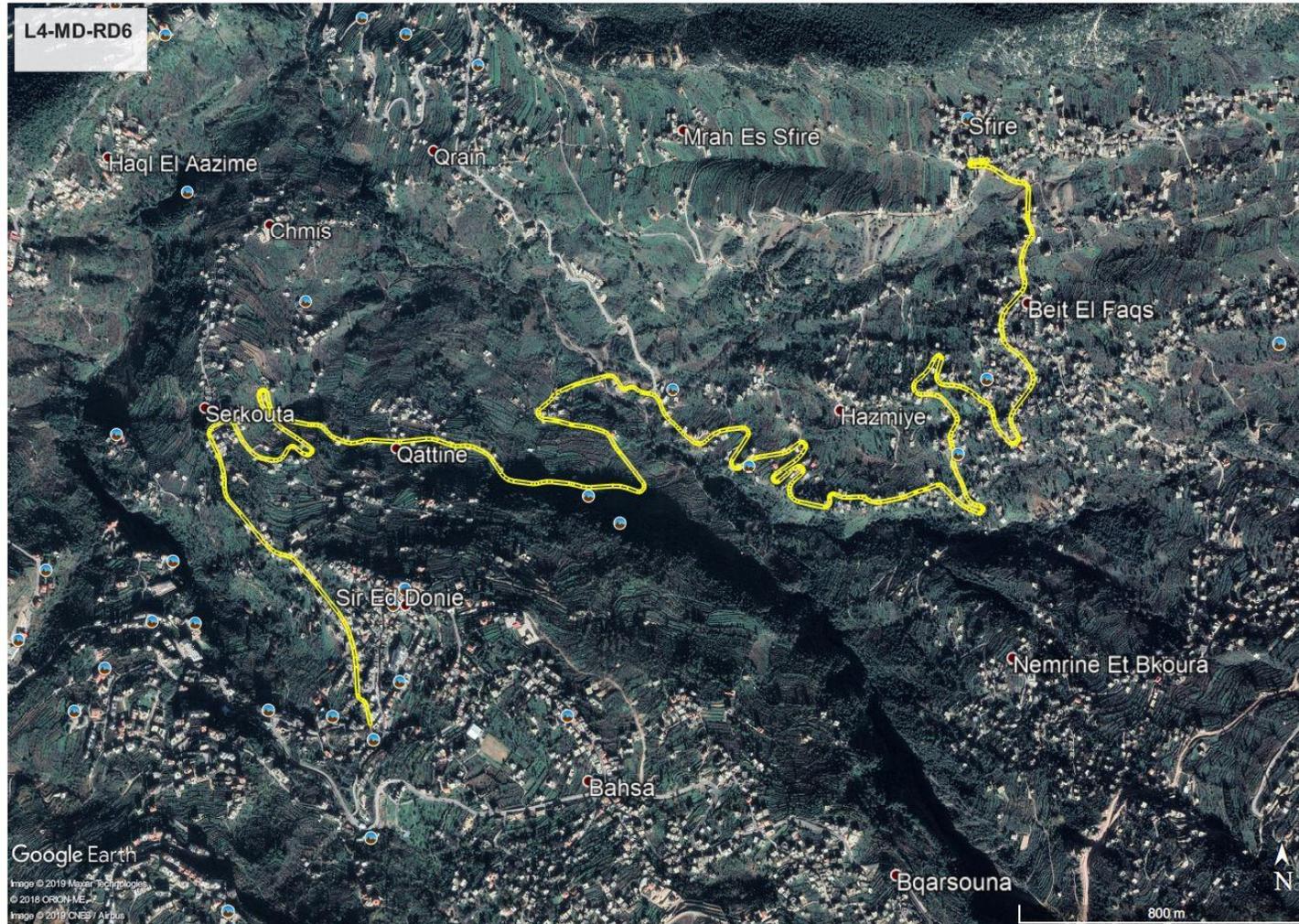
Source: ACE

Figure 3-3: Road L4-MD-RD4



Source: Google Earth, 2019

Figure 3-4: Road L4-MD-RD6



Source: Google Earth, 2019

Photos that were taken during the site visits can be found in Figure 3-5 and Figure 3-6.

Figure 3-5: Residential Areas Along One of the Proposed Roads (L4-MD-RD6)



Source: HK, ACE - November, 2018

Figure 3-6: Green Areas on Both Sides of One of the Proposed Roads (L4-MD-RD4)



Source: HK, ACE – November, 2018

3.2 Project Activities

The proposed project consists of the rehabilitation of existing roads in the Caza of Minieh-Danniyeh.

3.2.1 Road Selection

The road selection was determined by the cabinet of Ministers in their Meeting Number 32 dated 27/06/2019. The assessment of pavement condition follows several steps before identifying the type of repair activity needed for each stretch of road. The first step is the

initial visual assessment of the engineering design team. The outcome of such step is reflected in the following Table 3-2.

Table 3-2: Percentage of Asphalt Conditions for Each of the Proposed Roads (Based on visual Assessment)

Road Code	Severe Conditions	Warning Conditions	Minor Conditions	Acceptable Conditions
L4-MD-RD6	1.22%	9.42%	50.18%	39.17%
L4-MD-RD4	14.86%	35.92%	47.86%	1.35%
Total	7.71%	22.02%	49.08%	21.19%

The next step is a thorough visual examination of the identified distresses. After carrying out further studies such as Geotechnical investigation, Automated Traffic Counts and Road geometry (topographic survey), the pavement structure calculation takes place leading to identifying the right type of activity needed for each stretch of road.

3.2.2 Rehabilitation Works

Determining the condition of the asphalt is important to assign the proper pavement rehabilitation activities. The pavement rehabilitation activities consist of three activities: (1) either pavement maintenance or (2) overlay on existing pavement or (3) complete removal of deteriorated pavement and constructing a new one.

An estimated 80% of the works to be executed within this project fall under the following pavement related types of activities:

- A- Patching
- B- Milling and Overlay
- C- Pavement Total Reconstruction.

The phases for the main three activities are as follows:

A- Phases of Construction for a stretch of road that needs: Pavement Patching

- A.1- Saw-cut existing pavement in a rectangular shaped area where pavement distresses are located as per tender drawings and specifications.
- A.2- Remove asphalt layer within the limits of the executed saw-cut using hammer drill breaker operated by air compressor.
- A.3- Examine the exposed pavement structure under the removed asphalt using proper testing for base course and sub-base course layers as well as the subgrade level & material.
- A.4- Remove and replace or repair under asphalt layers as per technical assessments and recommendations.
- A.5- Execute asphalt layer(s) similar to surrounding asphalt thicknesses and parameters by either applying binder course asphalt layer and a wearing course asphalt layer (with prime coat & tack coat where required) or by applying directly the final wearing course after spraying prime coat over the prepared base course surface.

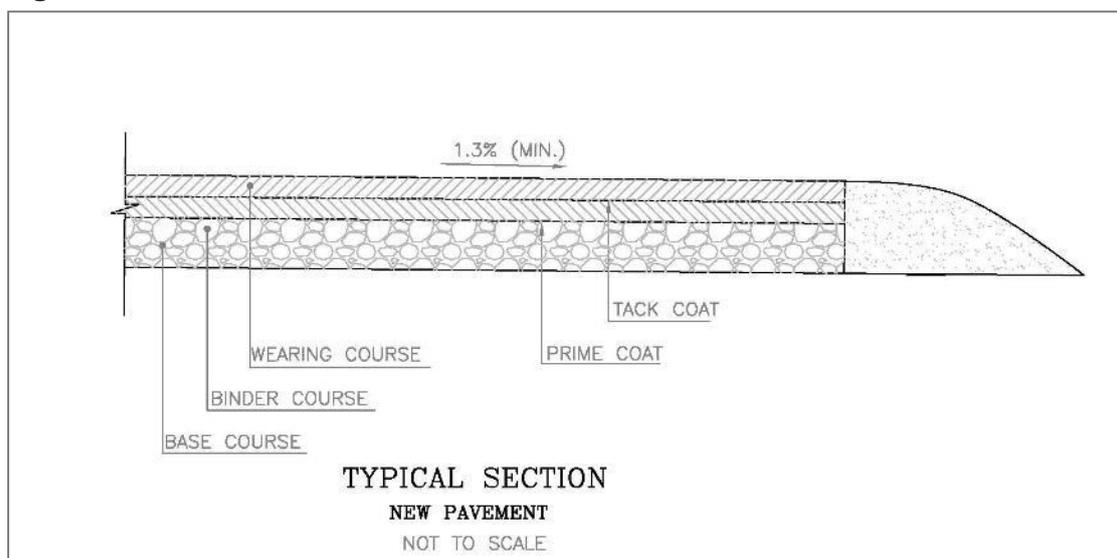
B- Phases of Construction for a stretch of road that needs: Milling & Overlay

- B.1- Contractor to proceed with the milling activity as described in the tender document with regards to the thicknesses of existing asphalt to be milled.
- B.2- New surface of asphalt obtained after milling shall be cleaned from all debris and dust with the use of mechanical road sweepers and water jets.
- B.3- Tack coat will be sprayed on the newly prepared clean surface of existing asphalt.
- B.4- Asphalt activity will take place using the right thickness of the new asphalt layer as per the design/tender documents. Such activity includes spreading asphalt as well as compaction of the new layer.

C- Phases of Construction for a stretch of road that needs: Pavement Total Reconstruction (Figure 3-7)

- C.1- Scrape and remove asphalt layer(s) to reach base course level.
- C.2- Excavate and remove the sub-base and base course layers to reach subgrade level.
- C.3- Prepare sub-grade surface after making sure by soil tests that reached subgrade level is suitable to receive pavement structure. If not, unsuitable material to be replaced by suitable borrow fill and compacted to reach required compaction percentage.
- C.4- Execute sub-base/base course layers as per specifications and thicknesses according to tender documents. Compact sub-base/base-course layers to reach required compaction level/percentage.
- C.5- Spray prime coat over the prepared and leveled surface of base course in order to receive asphalt binder course layer(s).
- C.6- Spread and compact asphalt binder course layer(s) as per the thicknesses and specifications specified in tender documents.
- C.7- Spray tack coat over the newly executed asphalt binder course in order to receive asphalt wearing course layer.
- C.8- Spread and compact asphalt wearing course layer as per the required specifications and thicknesses).

Figure 3-7: New Pavement Cross Section Scheme



The road sections in Minieh-Danniyeh Caza that require new pavement are as follows:

- Station 5Km 500m - 5Km 900m and 7km 340m – 8km 160m of L4-MD-RD 4
- Station 300m – 1km 210, 2km 600m – 3km and 5km 200m – 5km 530m of L4-MD-RD 6

The proposed project also consists of other activities beside the pavement rehabilitation works. These activities consist of:

- Installing concrete safety barriers
- Adding adequate traffic signs for stoppage give ways as warning signs, mirrors at sharp edges, and other regulatory and warning signs
- Marking lanes and stoppage line
- Rehabilitating sidewalks
- Construction or improvement of drainage systems
- Construction or improvement of retaining walls
- Relocation of existing utilities as needed
- Repairing street lighting

During the execution of rehabilitation works for a specific road, and in case the works imply the temporary closure of this road, other ancillary and associated works including traffic management during rehabilitation, reinstatement of roads disturbed by the works and tapering to the existing roads as necessary. Thus, traffic will be secured by the project operators via alternative routes to reach relevant destinations. However, the implementation of detours, diversions and road blockage will be determined during the rehabilitation phase by the contractor.

With regards to electrical street lighting activities, existing networks along the selected roads shall be assessed, repaired and rehabilitated. Works shall be limited to:

- Replacing damaged light poles or brackets,
- Replacing lighting luminaires or bulbs,
- Repairing electrical wiring (directly buried or laid in pipes),
- Adding light poles where needed,
- Removing light poles obstructing the road and placing them at proper locations in addition to executing of other miscellaneous electrical repairs to the existing street lighting network.

As this project is a road rehabilitation project, the speed limit will be assigned based on existing road curves. The designer thus defined the best fit center line for each road, in which the existing radius of each curve could be identified and posted the speed limit that complies with the minimum radius of curvature. The applicable speed limit for most of the roads were 60 kph based on road geometry in general cases and was reduced accordingly at stretches where sharp curves were encountered in which it was reduced as much as to reach 30pkh at very sharp curves.

3.3 Materials and Equipment

The required main materials and equipment for the rehabilitation of the proposed roads and its associated works are presented in the table below (Table 3-3).

Table 3-3: Materials and Equipment Used during the Rehabilitation Works

Materials	Equipment
Aggregates (fine and coarse)	Steel-wheeled Rollers
Asphalt mix	Pneumatic-tyred Rollers
Liquid Asphalt	Asphalt Distributor
Concrete mix	Concrete mixing trucks
Water	Trucks
Fuel	Excavators
Thermoplastic Paint Material	Loaders
Steel Guardrails	Asphalt Milling Machines
Stones (for stone pitching)	Steel Rollers
Reinforcing Steels	Motor Graders
Manhole Covers	Thermoplastic Road Marking Machines
Rubber Bitumen	Liquid Asphalt Spraying Tanks
Cat Eyes	Guardrail Post Driving Machines
Delineators	Paver instead of Asphalt Distributors
Traffic Signals	Dumper Trucks instead of Trucks
	Air Compressors
	Asphalt Cutters

3.4 Site Construction Staffing

The total number of workers for the overall road/project shall be based on the total volume of each activity as per the bill of quantities of the tender documents, as well as the independent assessment of the awarded contractor subject to the project duration and the planner's effort to produce a relevant program of work to cover all project activities. Therefore, the total number will be deduced accordingly.

As a result, the total number of labor (including equipment operators and machinery drivers) shall be in correlation with:

- Volume of each type of work (quantities in Bill of Quantities BOQs)
- Division of work as per the program of works to be submitted for approval by the awarded contractor. Such program of works shall be resource loaded to cover all required activities as per the tender documents and shall reflect actual numbers of labor with regards to each activity and the time dedicated for it, as well as for the total of the Project.

Furthermore, some indicative numbers of workers and drivers are provided in Table 3-4 and Table 3-5 per task and per day. All rehabilitation activities need the involvement of a certain number of workers ranging from unskilled labors to equipment drivers to foremen/engineers.

As described in table 3-4, the activities vary from pavement works to earthworks, piping, electrical, structural, and road safety. Each of such activity require specialized/skilled resources. As shown in tables below Table 3-4 and Table 3-5, the number of persons involved from engineers, technicians to workers as well as machinery drivers is variable as per the activity needed on each road. It is assumed that an estimate total number of workers shall range between 150 and 250. In addition, efforts will be made by the contractor to equally hire local (from the same region as the project location) and foreign (refugees) workers and drivers with equal contractual benefits and working conditions for Lebanese and Syrian. It is worth to mention that the workers will sign code of conduct (Annex 2) before starting the

work and training sessions will be conducted to inform the workers about their responsibility to act ethically.

Table 3-4: Number of Workers for the Different Project Activities

#	ACTIVITIES	Site Engineer	Safety Officer	Foreman	Surveyor	Assistant Surveyor	Skilled Carpenter	Semi-skilled Carpenter	Bar Bender (Steel Fixer)	Skilled Electrician	Skilled Welder	Skilled Laborer	Semi-skilled Laborer	Laborer	Total
1	Pavement Patching	1	1	1	1	1						1	1	4	11
2	Milling & Overlay	1	1	1	1	1						1	1	6	13
3	Pavement Total Reconstruction	1	1	1	1	1						2	2	10	19
4	Concrete Retaining Walls	1	1	1			1	1	1					3	9
5	Concrete Safety Barriers	1	1	1			1	1	1					3	9
6	Electrical Street Lighting Work	1	1							1	1			2	6
7	Culverts & Channels	1	1	1	1	1	1	1				1	1	4	13
8	Traffic Marking	1	1		1	1		1	1		1		1	2	10
9	Guardrails Fixing	1	1	1	1	1								2	7
10	Sidewalk & Tiling	1	1	1	1	1						2		4	11
11	Structural Elements	1	1	1			1	4	2					4	14
12	Earthwork (Excavation & Backfill)	1	1	1	1	1						2	4	10	21
13	Piping or Pipe Repair	1	1	1								1		2	6

Table 3-5: Numbers of the Machinery Drivers

#	ACTIVITIES	MACHINERY DRIVERS																
		Loader	Excavator	Motor Grader	Steel Roller	Milling Machine	Dump Truck	Water Tank Truck	Asphalt emulsion	Asphalt Paver	Pneumatic Asphalt Roller	Mobile Crane	Guardrail Post Driving	Concrete Mixer Truck	Mobile Concrete	Road Marking Machine	Pick-up Truck	Total
1	Pavement Patching	1	1		2		1	1	1	1	1						1	10
2	Milling & Overlay	1			1	1	3	1	1	1	1						1	11
3	Pavement Total Reconstruction	1	2	1	2	1	6	1	1	1	1						1	18
4	Concrete Retaining Walls							1				1		1	1		1	5
5	Concrete Safety Barriers							1						1	1		1	4
6	Electrical Street Lighting Work											1					1	2
7	Culverts & Channels	1						1						1			1	4
8	Traffic Marking							1				1				1	1	4
9	Guardrails Fixing						1						1				1	3
10	Sidewalk & Tiling							1									1	2
11	Structural Elements							1				1		1	1		1	5
12	Earthwork (Excavation & Backfill)		2		1		2	1									1	7
13	Piping or Pipe Repair																1	1

3.5 Site Facilities

The Project site will not include any facilities on-site including site offices for Engineers and for the Contractor, laborers camps, lodging on site, containers, power generators and repair garages.

During the work implementation, the Contractor will have to rent a flat located in the Project area to serve as a Project Offices. These offices will be used by the Contractor Engineers, technical skilled workers and Supervising Consultants. The flat will be equipped with toilet, kitchen (including drinking water and appliances), lockers and other supplies needed for the daily administrative activities. It might also serve as a meeting point for all Project workers at the start and end of their shifts.

The work implementation will also require unskilled workers (laborers) needed to perform earthworks on-site. The Contractor will be encouraged to hire laborers from the local community living in the Project area. During working hours, laborers will be entitled with a one-hour break on-site. Usually, every laborer brings from home his own food and drinking water. The on-site rest point will be decided by the Contractor at the time of works.

The Contractor will have to service the on-site with portable cabin toilet. The porta cabin will be mobile and its placement depends on the length of the work zone. Accordingly, the Contractor will have to move it based on the progress of rehabilitation works. The Contractor should link the porta cabin toilet to the existing wastewater network. In case the network is not available within the work zone, the Contractor will need to link it to a polyethylene storage tank and the Supervising Consultant shall inspect it on a regular basis and ensure the application of proper mitigation measures.

For vehicles and equipment, the Contractor will have to rent a land within the Project area. This land should be fenced and used for parking purpose only. The Contractor shall not perform any repair on site and is obliged to execute vehicles and equipment maintenance in a repair shop preferably located within the Project area.

4. BASELINE ENVIRONMENTAL & SOCIAL CONDITIONS

This section presents an overall description of the baseline environmental and social conditions in the study area and mainly in the Dannieh region as the two project roads are located in this region, which is in the Caza of Minieh-Danniyeh. It is divided into three sections covering the physical, biological and socioeconomic environment. Additional details on environmental components occurring along each of the roads are presented in Annex 1.

4.1 Physical Environment

4.1.1 Topography

The Caza of Minieh-Danniyeh is surrounded by Akkar in the North, Hermel in the East, Bcharre and Zgharta in the South, and Tripoli in the South-West. The Caza consists of two regions:

1. Coastal Minieh-Danniyeh: This region constitutes the western part of the qaza, bordering the Mediterranean Sea and forming a coastal ribbon that extends from Tripoli and Zgharta in the South to Akkar in the North. It forms an important corridor that includes the international road to Syria, several vital facilities (the Deir Amar power plant), and trade and service outlets. It is also one of the major entry points into the heart of Danniyeh.
2. Upper Minieh-Danniyeh: The center of this region, otherwise known as Danniyeh, is Sir El Danniyeh. It extends westward to cover 49 cadastral zones and 31 villages, covering 91% of the Caza total area. This region opens access to Hermel via the Sir-Jbab El Homr-Hermel road which traverses Lebanon's western mountain range. It is known for its rich natural and water resources, hence the importance of agricultural in its economy (UNDP/CRI 2012).

Minieh-Danniyeh of the North region, where the proposed roads are located, is around 110 km away from the capital of Beirut. The roads in Minieh-Danniyeh lies within a range of 300 m (Ouyon El Samak) and 1,000 m (Sir El Danniyeh) above sea level.

4.1.2 Geology

The geological formation of the proposed roads that are located within the Caza of Minieh-Danniyeh are presented in Figure 4-1. Based on the geological map below, the main geological formation within the study belong to the following:

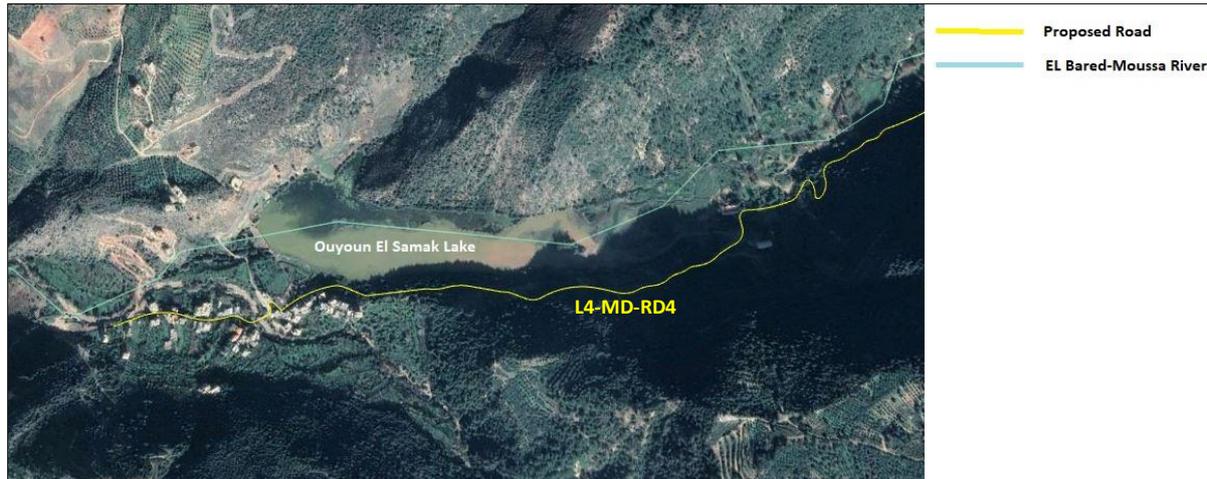
- ncg: coarse torrential pudding
- Sannine Limestone, of Cenemonain age unit (C₄); this unit is divided into three subunits namely:
 - Dolomitic Limestone (C_{4a}): this formation is characterized by geodes of different sizes filled or voided and a thickness of about 300 meter. Within this unit Ammonites and fish fossils were found.
 - Bluish marl and shale (C_{4b}): this formation contains crystals of quartz, chert nodules and bands form. The thickness of this unit is in the range of 80-100 meter
 - Limestone and dolomitic limestone (C_{4c}): The Limestone of this unit is highly karstifie. The color of this formation is white to brown and its thickness is about 300 meter.
- Miocene - marly conglomerates and reef limestones (m₂): weathered grey marl that was originally loose marine greenish marl. This formation is inter-bedded with marly limestone in some parts. The thickness of this outcropping is around 150 m and is known to be reach in foraminifera fossils.

- White marl and marl-limestones (C₆): Cretaceous and lower Tertiary sediments indistinguishable lithologically; stiff bluish plastic Marl with glauconite, interbedded with chalky marly Limestone and nodules of black chert. This formation has a thickness that ranges from 400 m to 150 m and is rich in foraminifera fossils.
- Maameltain or Ghazir Limestone, of Turonian age (C₅): Joined with C_{4c} except when distinguished by fossils. It is mainly composed of hard crystalline and micritic limestone to dolomitic limestone, creamish white to brown in color. The weathered color of this unit is mainly grey. Limestone / dolomitic limestone are highly karstified also within this formation, geodes of different sizes filled or voided are recorded.

4.1.2.1 Hydrogeology

Road L4-MD-RD4 runs in close proximity to El Bared River and its tributaries and near Ouyoun El Samak Lake (Figure 4-2 and Figure 4-3), which lies between the districts of Minieh-Danniyeh and Akkar, near the village of Saffaret el-Katih. Moreover, several springs are located within the study area, including Ain Markabta, Ain Es Sayed and Ain Marmar. The two proposed roads of the project have some sections that are either at proximity or crosses the water courses. In addition, during the site visits, a water source was observed on the left of the road L4-MD-RD6.

Figure 4-2: Road L4-MD-RD4 Location Near Ouyoun El Samak Lake



Source: Google Earth, 2019

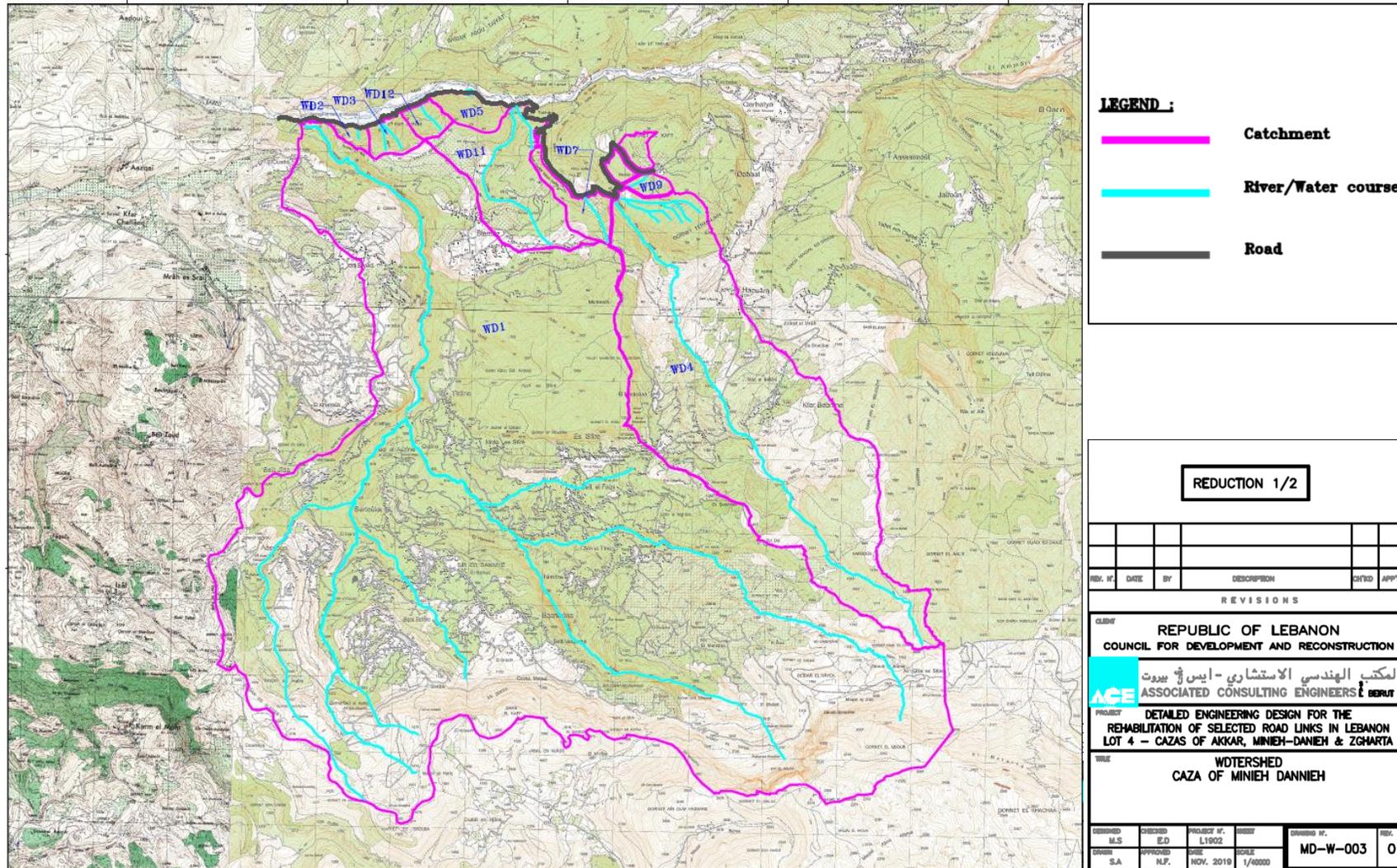
Figure 4-3: A Photo of Ouyoun El Samak Lake Near Road L4-MD-RD4



Source: HK, ACE-November, 2018

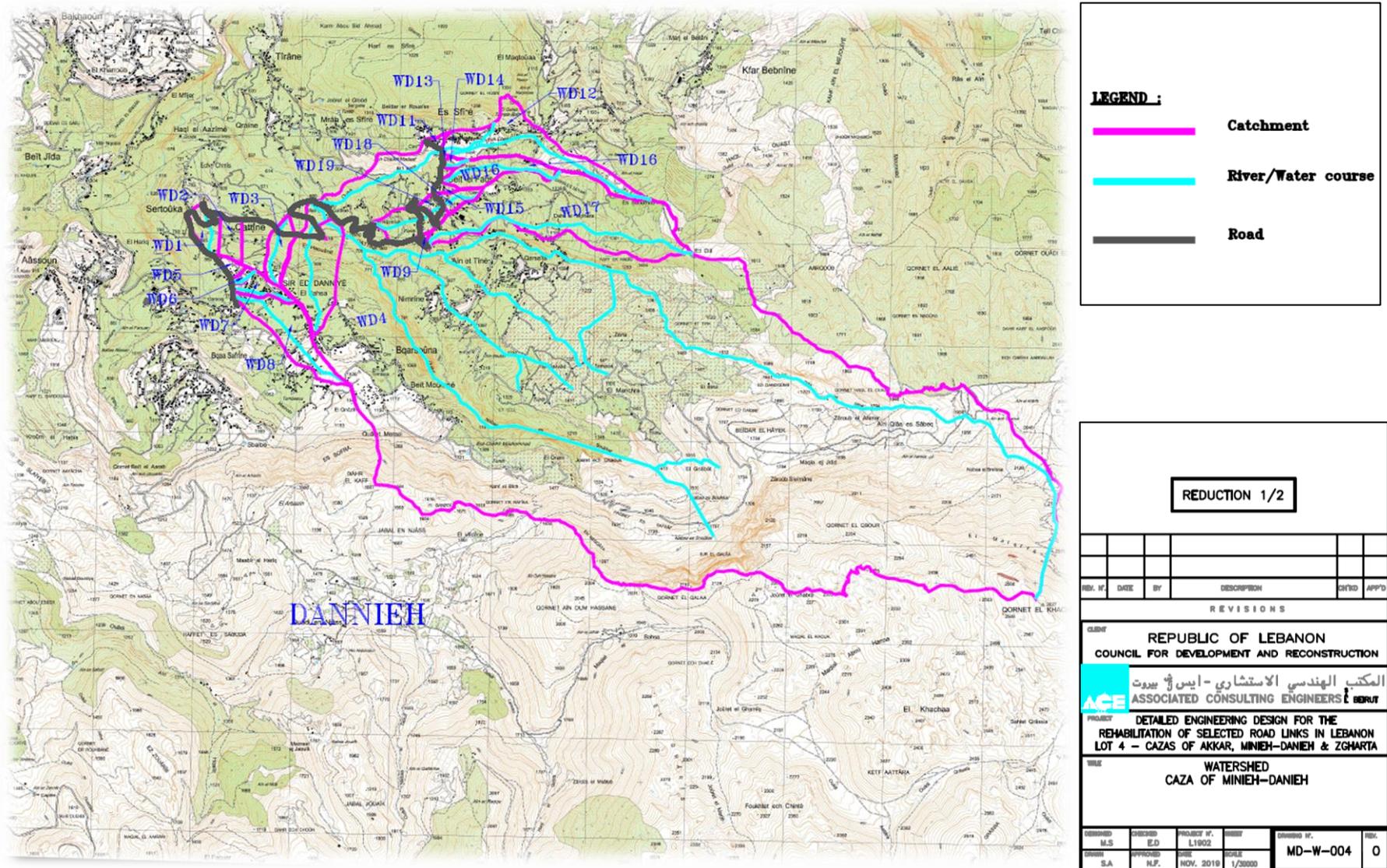
Figure 4-4 and Figure 4-5 show the proposed roads of the project with respect to the rivers and their watersheds in the Caza of Minieh-Danniyeh.

Figure 4-4: Major Rivers in Minieh-Danniyeh District and Location of Existing Project Road L4-MD-RD4



Source: Armée Libanaise, Direction des Affaires Géographiques, échelle 1/20000

Figure 4-5: Major Rivers in Minieh-Danniyeh District and Location of Existing Project Road L4-MD-RD6

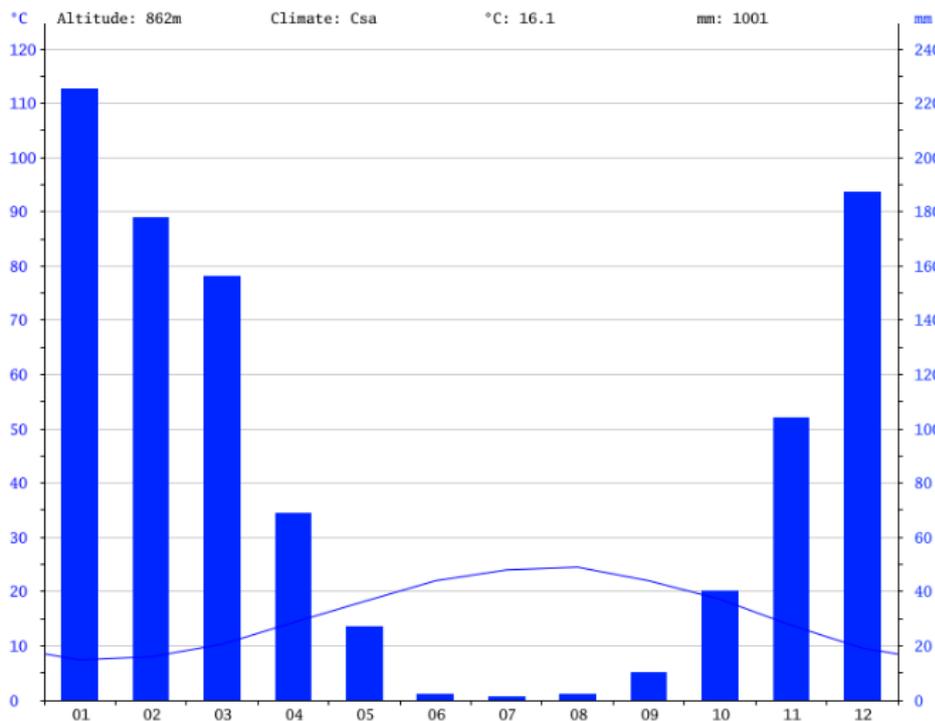


Source: Armée Libanaise, Direction des Affaires Géographiques, échelle 1/20000

4.1.3 Climate and Meteorology

The Village of Qattine is part of L4-MD-RD6 and lies on 862 meters a.s.l. where most rain events fall in the winter during the month of January (225 mm of precipitations). However, the driest month is July, with 1 mm of rain. The average annual rainfall in Qattine is 1,001 mm. The average annual temperature in Qattine is 16.1 °C. The warmest month of the year is August with an average temperature of 24.5 °C. On the contrary, the coldest month of the year is January with an average temperature of 7.4 °C (climate-data.org, 2020). The Climograph of Qattine village is represented in Figure 4-6.

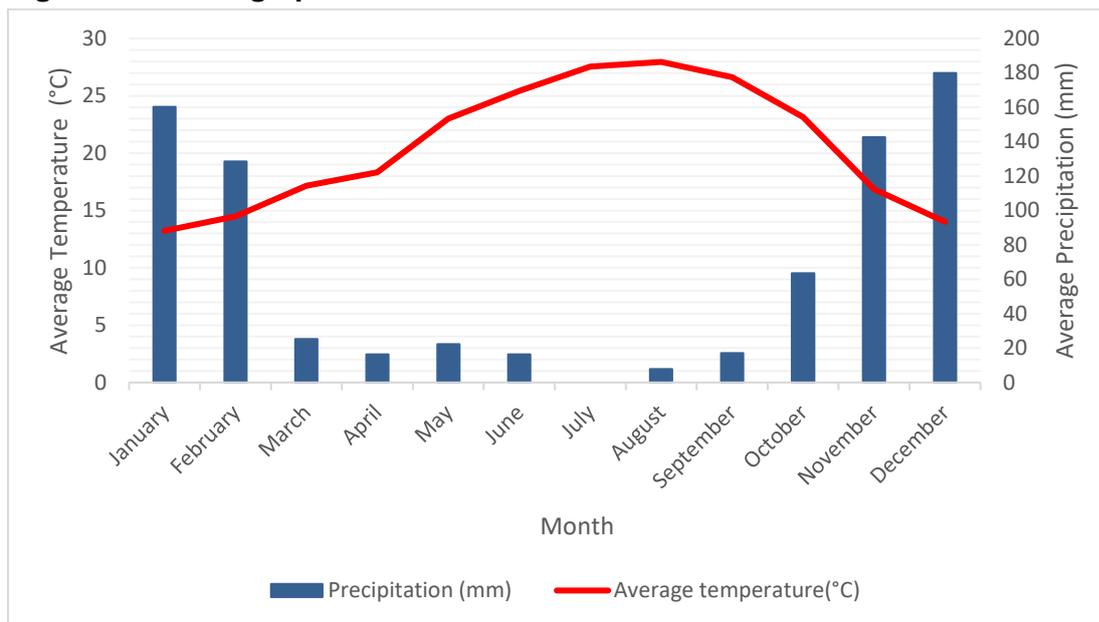
Figure 4-6: Climograph of Qattine Village at 862 m in Minieh-Danniyeh Caza (Historical Data between 1982 - 2012)



Source: climate-data.org, 2019

Additional data on climate in the area was obtained from the Lebanese Agriculture Research Institute (LARI) from its station in the village of Aabdeh that is around 8.5 kilometers away from the project area and located at the altitude 100 meters a.s.l. This data represents the average temperatures and average precipitation of the year 2018 (Figure 4-7).

Figure 4-7: Climograph of Aabdeh of LARI Station at 100 m for the Year 2018



Source: LARI, 2018

As for the wind data, wind speed and direction data were also obtained from LARI from its nearest station in Aabdeh that is around 8.5 kilometers away from the project area and located at the altitude 100 meters a.sl. Table 4-1 represents the average monthly and annual wind speed and direction for the year of 2018.

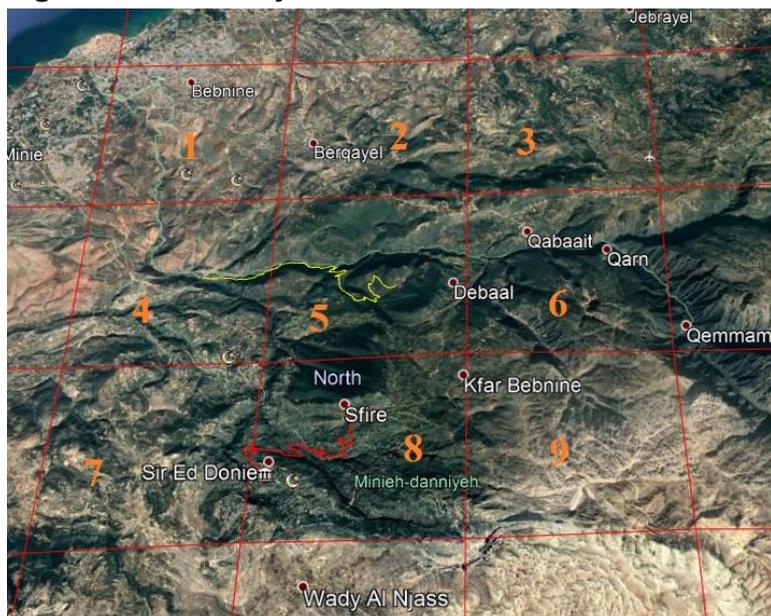
Table 4-1: Monthly and Yearly Averages of Wind Speed (m/s) and Direction (degrees) registered by Aabdeh's LARI Station in 2018.

Month	Jan	Feb	Mar	Ap	May	June	July	Aug	Sep	Oct	Nov	Dec	Average per year 2018
Monthly Average Wind Speed (m/s)	0.7	0.44	0.72	0.45	0.48	0.77	0.86	0.74	0.46	0.31	0.388	0.54	0.57
Monthly Average Wind Direction (Degrees)	224.8	218.39	240.48	208.1	211.48	225.6	235.77	207.45	219.83	218.58	208.76	216	219.6

Source: Data provided by LARI on January 2, 2020

4.1.4 Air Quality and Noise

Ambient air quality of the project area was requested from MOE. Data was available from the UNDP project “Air quality assessment in an East Mediterranean country: the case of Lebanon” which is based at the Ministry of Environment for the year 2010. The available data is for criteria pollutants: Particulate Matter (PM), Ozone (O₃), Carbon monoxide (CO), Nitrogen dioxide (NO₂), Sulfur dioxide (SO₂). The project area was divided into different cells (Figure 4-8) and the data of the annual background average concentrations in µg/m³ was obtained. Table 4-2 shows the detected annual concentrations, the national limit values dictated in Decision 52/1 dated 1996 and WHO Guidelines. For some parameters, the obtained data on air quality is the annual concentrations while some of the standards are available only for intervals of 8 hours or 24 hours.

Figure 4-8: The Project Area Divided into Different Cells

Source: Data provided by the Ministry of Environment on January 3, 2020

Table 4-2: Annual Ambient Air Quality at the Project Site (The Roads are Located on Cells 4,5 and 7,8) for the Year of 2010

Pollutant ($\mu\text{g}\cdot\text{m}^{-3}$)	NO ₂	O ₃	PM ₁₀	PM _{2.5}	SO ₂	CO
Concentration in Cell 4	20.741	78.418	19.637	16.981	16.061	301.434
Concentration in Cell 5	15.290	81.062	17.544	15.267	12.388	247.759
Concentration in Cell 7	15.018	81.512	17.567	15.256	12.530	251.064
Concentration in Cell 8	13.361	81.040	16.499	14.393	11.022	220.396
Lebanese Standards	100 (Annual)	100 (8 hrs)	80 (24 hrs)	-	-	10,000 (8 hrs)
WHO Guidelines	40 (Annual)	100 (8 hrs)	20 (Annual)	10 (Annual)	20 (24 hrs)	10,000 (8 hrs)

Source: Data provided by the Ministry of Environment on January 3, 2020

The results have shown that the concentrations of NO₂ in all the cells comply with the national standards. As for the concentrations of PM₁₀, the obtained values were in compliance with the WHO Guidelines while PM_{2.5} were not in compliance with the WHO standards for air quality.

As for the level of noise in the region, as no data was available on the project location, observations during site visits showed that noise does not seem to be significant along most of the two roads with no sources of noise pollution observed. However, the noise level was observed to be slightly higher around other populated areas where transportation is affected by the bad conditions of the narrow roads which increase traffic congestions and makes it difficult to the visitors to reach their destination.

4.1.5 Land Use/Land Cover

In Minieh-Danniyeh Caza, the most common land use is agriculture and grazing (UNDP-ARTGOLD, 2012). The project team has conducted site visits to all the project roads in the Caza of Minieh-Danniyeh in order to collect information about the environmental features along the roads including the vegetation cover composed of natural areas, agriculture areas and planted trees. During the site visits, different kind of trees and areas were observed. These are as follows:

- Natural terrains with diverse vegetation have dominated along roads L4-MD-RD4

- It was observed along Road L4-MD-RD6 the presence of Oak, Pine, Cypress, Figs and different fruit trees such as pears and apples
- Naher El Bared River and Oyoun El Samak lake runs along road L4-MD-RD4.
- A water source was noticed on Station 4850 of Road L4-MD-RD6

Table 4-3: Visual Classification of Land Use based on Google Maps

Municipality	Land Use
Azka	Sparsely populated with dense natural landscape
Btermaz	Sparsely populated with agriculture areas
Bzal (small part) - Akkar	Moderately populated with agriculture areas
Debaael	Sparsely populated with agriculture areas
Sir	Densely populated
Kattiné	Sparsely populated with agriculture areas
Qraine El Hazmieh	Sparsely populated with agriculture areas
Aïn El Tiné	Sparsely populated with agriculture areas
Karseita (small part)	Sparsely populated with agriculture areas
Beit El Faks	Sparsely populated with agriculture areas
Al-Sfiré	Moderately populated with agriculture areas

Source: Google Maps, 2019

A detailed list of the existing areas along the roads is presented in Annex 1.

4.2 Biological Environment

4.2.1 Flora

The Caza of Minieh-Dinnieh hosts an important biodiversity and a natural richness that have been attracting the seekers of investments (UNDP/CRI, 2012). The Caza comprises a variety of forests and is home to one of the evergreen coniferous tree called “Lazzab” or juniper that is a remarkable tree of the forest heritage of this region due to its high resistance to the severe climatic conditions of the high mountain (EUROMED, 2018). Moreover, the banks of El Bared river that was identified at proximity of road L4-MD-RD4 have included a woody vegetation with species of reeds such as *Arundo donax* and *Arundo plinii*. In addition, *Typha australis* and *Mentha spp* occupy the humid terrestrial sites and *Polypogon monspeliensis* and *Paspalum paspaloides* are mainly present on the sands. Moreover, many other plants like *Ricinus communis*, *Conyza bonariensis* and *Bidens frondosa* are present on the banks of the river (GFA Consulting Group, 2014).

During the site visits, many trees were identified along road L4-MD-RD6 such as Pine, Oaks, Cypress and different fruit trees such as figs, apples and pears. Moreover, the natural areas and landscapes have dominated along Road L4-MD-RD4.

4.2.2 Fauna

The fauna in the Caza includes mainly animals that are raised for livestock production such as goats, sheep, bees and poultry. However, wild animals are common are also present mainly in the forests and the surrounding natural areas. Among the wild mammals are the fox (*Vulpes vulpes*), the squirrel (*Sciurus sp.*), the badger (*Meles meles*), the mongoose (*Herpestes sp.*), the hedgehog (*Erinaceus europaeus concolor*), the striped hyena (*Hyaena hyaena syriaca*) and the wild boar (*Sus scrofa*) (AFED,

2005). During the site visits, wild animals including mammals and birds were not identified. Moreover, livestock were noticed in some farms along some of the roads and in a part on the road L4-MD-RD6 of Sir El Donniah village where sheep and goat were grazing.

4.2.3 Ecologically Sensitive Areas

The District of Minieh-Danniyeh comprises the Upper Mountains of Akkar-Danniyeh that were declared as an Important Bird Area (IBA) by BirdLife International where 134 bird species are observed such as the regional endemic Syrian Serin that is only found in the Middle East. However, the nearest road (L4-MD-RD4) is about 4 km away from this IBA (Figure 4-9).

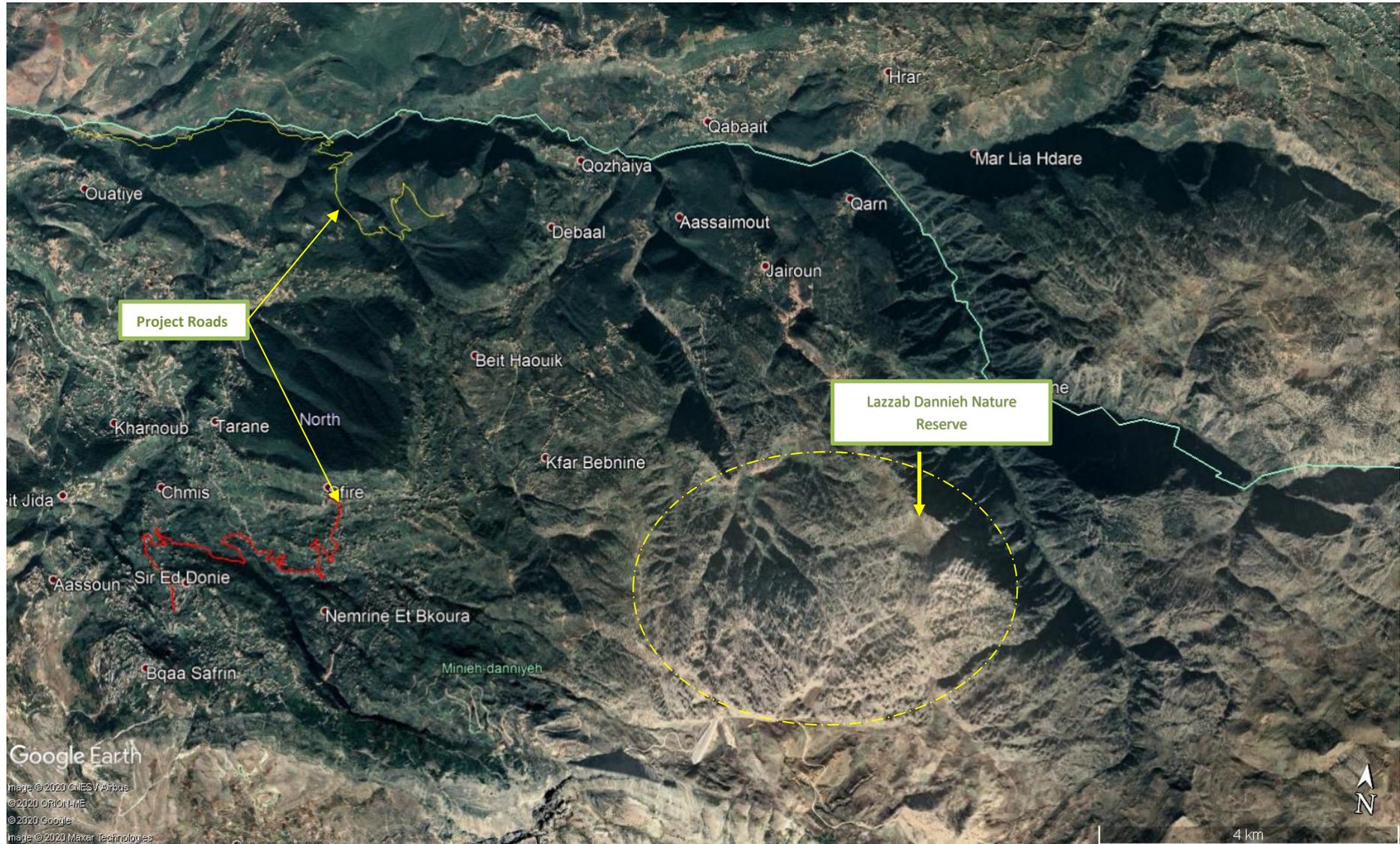
Figure 4-9: Location of the Upper Mountains of Akkar-Danniyeh IBA and the Nearest Road (L4-MD-RD4)



Source: BirdLife International, 2019

In addition, the area harbors a proposed protected area under the name of Lazzab Danniyeh Nature Reserve. The MOE approved the draft law and has submitted it to the Council of Ministers. The declaration of this reserve as a protected area awaits the approval of the Lebanese Parliament on this draft law. The Nature Reserve is located within the boundaries of the following villages: Kfarbnine, Jairoun, Qemmamine, and Mrebbine that are not within the project area (lazzabDanniyeh website, 2013). However, the two roads of the project span around 2 Km of this proposed protected area.

Figure 4-10: Project Roads in Reference to the Nearest Proposed Nature Reserve of Lazzab Dannieh



Source: Google Earth, 2019

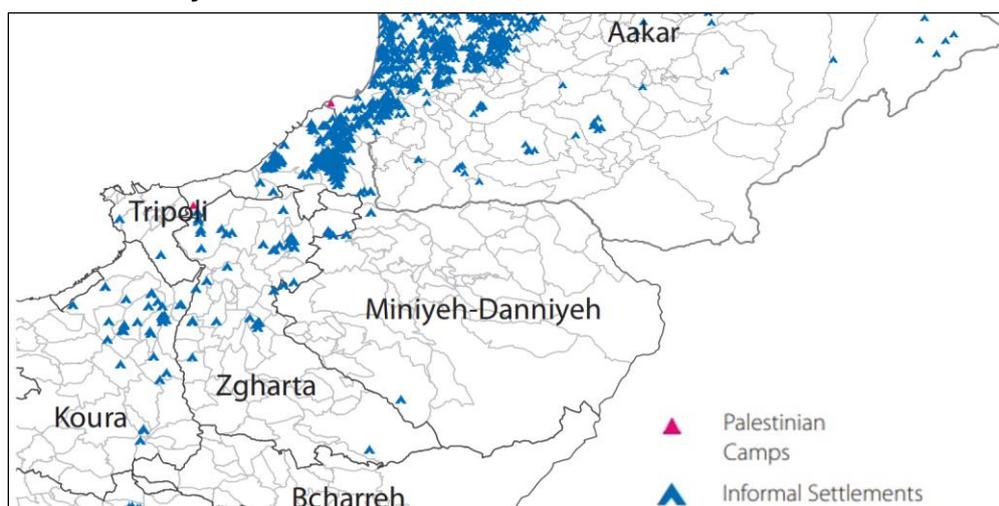
4.3 Socio Economic Environment

4.3.1 Demographic Profile

North Lebanon has a total population of 781,930 of which 218,940 (28%) dwell in Minieh-Danniyeh Caza. In 2016, the population density in the Caza was 169 people per Km² (IDAL, 2018). Danniyeh is characterized by a high population growth according to the Territorial Strategic Development Plan of Danniyeh Region report published by the UNDP year 2012. This growth was confirmed by the 38.2% increase in registered residents within 15 years between the year 1996 and 2010 (UNDP-ARTGOLD, 2012). The large household size in Danniyeh region is explained by high fertility rates. The average household is composed of 4.7 members compared to 3.8 members on the national level (CAS, 2019). As for the demographic composition according to age groups, the Danniyeh region is characterized as a young region whereby 42.5% of the total population are below 18 years old and 70% are below 40 years (UNDP-ARTGOLD, 2012).

According to the Syria Refugee response in the North Governorate (UNHCR, 2019), the total number of registered Syrian refugees in each village of the project area is presented Table 4-4, showing that as of end of 2019, the total number of registered refugees in the project area was 6,053. Moreover, there are 44,502 Palestinian Refugees in Minieh-Danniyeh. Data on informal tented settlements is only available for the entire North region, hosts 145 settlements where 10,888 registered Syrian refugees currently reside (OCHA, 2016). Figure 4-11 shows the distribution of the informal settlements of Syrian refugees as well as the Palestinian camps in part of the North Governorate including Minieh-Danniyeh. However, during site visits none of these settlements were observed near project roads.

Figure 4-11: Informal Settlements of Syrian Refugees and Palestinian Camps in Minieh-Danniyeh Caza



Source: OCHA, 2016

Table 4-4: Registered Refugees in Each Municipality along the Proposed Roads

Municipality	Number of Syrian Refugees
Azkai	93
Btermaz	184
Debaael	0
Sir	4,861
Kattiné	32
Qraïne El Hazmieh	0

Municipality	Number of Syrian Refugees
Ain El Tiné	122
Karseita (small part)	104
Beit El Faks	235
Al-Sfireh	422
Total	6,053

Source: UNCHR, 2019

The unemployment rate in the North Governorate is estimated at 8% compared to the national average of 6.4 % (IDAL, 2018). The unemployment rate as of the year 2009 by the administrative sector of Akkar and Minieh- Danniyeh is 7% (IGSPS, 2012). The number of vulnerable Lebanese in Minieh-Danniyeh District is 69,227 (OCHA, 2016). Akkar/Minieh-Danniyeh District have experienced the highest percentages of overall and extreme poverty. These districts encompassed 10% of the population of the North Governorate, yet 25 % of its poor live in Akkar/Minieh-Danniyeh Districts (El Laithy *et al.*, 2008).

4.3.2 Economic Activities

The main economic activity in Minieh-Danniyeh is agriculture whereby the income of 90% of the permanent residents originates totally or partially from agriculture. The region is well-known for its trees especially fruit trees. Various agricultural goods are produces and include:

- Olive trees in coastal areas,
- Almond and fig trees,
- Summer vegetables,
- Tobacco,
- Grains in rural areas.

However, the poor management of water resources, use of traditional agricultural methods, and lack in agricultural experts, pharmacies and VET establishments resulted in a decrease in gross agricultural areas.

Other economic activities include:

- Beekeeping,
- Domestic animal farming,
- Poultry farming,
- Livestock grazing,
- Firewood and charcoal making,
- Agro-food industries,
- Small-size industries and craftworks,
- Trade sector,
- Tourism sector (UNDP-ARTGOLD, 2012).

During the site visits, many shops, restaurants, health centers and car repairing shops were identified along the way and are in close proximity to some road stations especially in the residential areas. For example, along road L4-MD-RD4 there are a school (Oyoun Al Samak official school), a health center and three restaurants (Oyoun Al Samak restaurant, Ain Al Baraka restaurant and Al Bacha restaurant). As for L4-MD-RD6, the observed features were car maintenance shops and small shops, three Mosques, a minimarket, a small bakery and the entrance to a recreational site of Al Zahlan

Grotto. Moreover, a hydropower plant was identified on El Bared river (L4-MD-RD4). This can be found in Annex 1. A description of how these shops and sources of livelihoods will be affected are included in section 5.3.13. Proposed mitigation measures such as access to these shops and sources of livelihood during construction are included in section 6.3.1.1.

4.3.3 Education Services

In the Minieh-Danniyeh region illiteracy is concentrated at high age groups mainly among women. Moreover, a large group of the population (42%) has attained lower education whereby this group didn't reach intermediate levels.

According to the Ministry of Education and Higher Education (MEHE) statistics, the Caza of Minieh-Danniyeh has the following educational institutions:

- 1 kindergarten in Sir Danniyeh;
- 17 primary schools;
- 41 intermediate schools;
- 10 secondary schools;
- 3 vocational and technical education establishments.

A total number of 14,000 students are registered in schools in the region. The distribution of the students is as follows: 75% in public schools, 25% in private schools. Moreover, 55% of total students in the region are female students compared to 45% of males. It is worth to mention that the educational sector still faces problems thus affecting its development. These problems are:

- Outdated traditional curriculum;
- Weak teaching skills of foreign languages;
- Lack of special educational expertise;
- Lack of specialized teachers;
- Unbalanced school distribution per educational levels;
- Unbalanced school distribution per regions;
- Unbalanced distribution of private and public schools;
- Poor building conditions including facilities with the schools;
- Absence of extra curriculum activities (MEHE, 2010).

4.3.4 Health Services

Despite the large number of specialists, doctors, nurses available in the region, the health sector in Minieh-Danniyeh is unable to provide basic medical services to residents. As such, the residents in the region, especially the poor ones, tend to rely on pharmacists' medical treatments and only refer to specialists when they are not cured by pharmacists' prescriptions. It is worth to mention that the public hospital in Sir, located in Aassoun, was inaugurated in 2002 and comprises 40 beds. However, this hospital doesn't have reanimation and intensive care departments. In addition, one of the main problems that affects the health sector in Minieh-Danniyeh region is the lack of specialized hospitals that provide treatment to diseases such cancer, heart pressure, diabetes and nervous diseases in addition to physical and mental handicap and Thalassemia (UNDP-ARTGOLD, 2012).

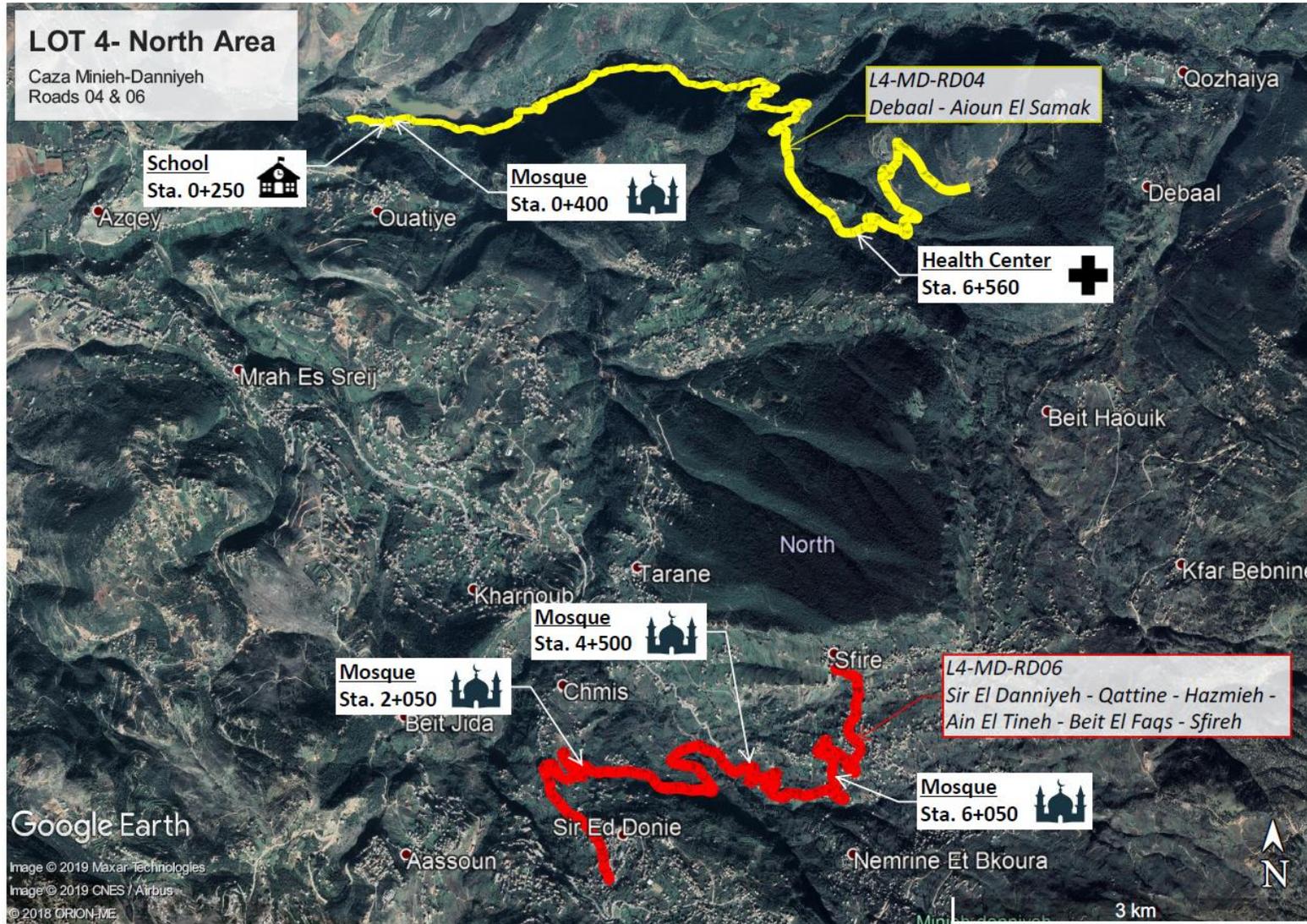
4.3.5 Cultural Heritage

Due to its historical ruins and its several cultures, the Caza of Minieh-Dannieh was inhabited since prehistoric ages. The Mamluk and Ottoman eras have shaped this region with their own determinants. A skeleton, believed to be present since the Neolithic age or the new stone was discovered in the Zahlan Grotto in the region of Qattine. The entrance to the grotto's recreational site was identified near L4-MD-RD6 and the grotto is far from the project road (around 415 meters away). Moreover, the main archeological sites that are present by some villages of the project area are as follows (UNDP-ARTGOLD, 2012):

- Caves with ancient drawings (Silsila cave / Birket Al Hamra) in Azkai
- Namroud Castle (Roman)/old monastery/alabaster cemetery in Btermaz
- Ancient wells in Debaal
- Traditional houses and palaces / Mills in Sir
- Housen Castle (Roman) in Al-Sfireh

However, none of these sites of archeological or cultural importance were detected by the team along the roads.

Figure 4-12: Schools, Mosques and Health Care Centers Within Project Area



Source: ACE

5. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

This section describes the potential anticipated positive and negative environmental and social impacts associated with the rehabilitation of the selected roads and the required networks in Minieh-Danniyeh Caza.

5.1 Assessment Methodology

The evaluation of potential environmental impacts was based on scientific evidence, literature review and the professional judgment of the Consultant. The impact classification and ranking approach that was applied is as follows:

- Identification of project-related activities (during both rehabilitation/reconstruction and operation phases) and environmental aspects;
- Determination of potential impacts on the natural and man-made environment that might arise from these activities;
- Assessment and evaluation of potential impacts based on the criteria set out in the Environmental and Social Management Framework of the project.

As such, impacts were weighted on the scale of P, 2P, O, N, 2N to signify Positive, strongly Positive, Neutral, Negative, and Strongly Negative impacts respectively.

5.2 Potential Positive Impacts during Rehabilitation

The rehabilitation of the proposed roads in Minieh-Danniyeh caza is considered as an economic opportunity for the selected contractor and their subcontractors. Local businesses may benefit from rehabilitation activities through selling raw materials, equipment, machinery and goods and the project will create jobs and could hire labors from the local community (Lebanese and Syrian). In addition, local garages will benefit from increased business in vehicle and equipment maintenance and residents will benefit from the rent fees of the offices and residences as well as vehicle and equipment parking area. The influx of workers will also increase economic activity in the area as they will likely purchase their daily requirements from the surrounding shops. This will have a ripple effect within the communities where the roads will be rehabilitated. This impact is, however, temporary and jobs will be discontinued as soon as rehabilitation works are complete.

As such this impact on economic activity in the region is considered as a positive impact (P).

5.3 Potential Environmental Negative Impacts during Rehabilitation

The majority of impacts resulting from the project will occur during the road rehabilitation phase. However, most of these impacts are temporary for the duration of the works.

5.3.1 Water and Soil Quality

Contamination of soil, underground and surface water from the rehabilitation of the proposed project might occur as a result of several activities. These include the improper disposal of solid waste and excavated material, inappropriate discharge of liquid waste, wastewater, accidental oil and chemical spillages, and diversion of contaminated rainwater runoff from the project site. One river (El Bared River) was identified near road L4-MD-RD4 at Azka and oyoun El Samak villages and a water source were identified at proximity of the roads L4-MD-RD6 at Qattine and Ain Al Tineh villages. As such, if the generated solid waste and liquid waste were not contained properly, surface water

pollution might occur through the transport of pollutants such as debris and suspended solids into the river and water bodies through runoff.

A detailed description of the sources of pollution along with the associated activities is listed below:

Liquid waste from rehabilitation

Major rehabilitation activities that lead to the generation of liquid waste include:

- Concrete mixing for the retaining walls and sidewalks;
- Excavation road sections that are in sever conditions generating runoffs contaminated with suspended solids, especially during rainy days if the rehabilitation work will start in the fall season;
- Storm water runoff that contains high amounts of suspended solids

This liquid waste might pollute nearby rivers, streams and soils if not discharged and managed properly.

Wastewater

Workers will be needed during the rehabilitation of the proposed roads and its associated works. As such workers will generate wastewater during the entire rehabilitation phase from the use of the portable cabin toilet. If the generated wastewater was not managed to be discharged in specific tanks or connected to existing sewage network, nearby surface water bodies might be polluted with high organic loads especially El Bared River that was identified near road L4-MD-RD4 at Azka and Oyoum El Samak villages and the water source identified at Station 4,850 of the road L4-MD-RD6 at Ain El Tineh village.

Accidental Spillage

Water and soil can be polluted as a result of accidental oil spills from the equipment used for rehabilitation of the roads. The spills may occur during re-fueling of oil supplies for machinery generation, as well as using oils and lubricants during operation. Accidental spill of oils may occur and contaminate the underground water resources especially in the case where soil layers are permeable to these materials that could be easily infiltrated. The spills may also affect water quality of El Bared River and its watershed during the rehabilitation of the two proposed roads.

Solid Waste Generation

The rehabilitation activities of the roads may generate solid waste from construction materials such cement and their resulting empty bags, electrical wiring, rebar, wood and piles of sand, ruined asphalt and dirt due to excavation. Inappropriate waste handling and improper disposal practices of this type of waste may result in ground and surface water contamination due to leaching and runoffs, hence, reduction in overall water quality. In addition, these materials could be directly discharged into El Bared River as this river passes through a road of the project area at L4-MD-RD4. Furthermore, improper disposal of solid waste, inappropriate discharge of wastewater and accidental spills (fuel, oil,) can have a negative impact on the soil quality.

As such, the impact on the water and soil quality in the area of the proposed project during rehabilitation is evaluated as negative (N).

5.3.2 Air Quality, Noise and Light

The machinery and vehicles used during the rehabilitation phase produce air emissions and gases that can temporarily affect local air quality. In general, air emissions generated from the combustion of diesel used by machinery and vehicles contain particulate matter, Benzene, Toluene, Xylenes, Ozone, Nitrogen Oxides, and Sulfur Oxides, Carbon Dioxide and Carbon Monoxide.

Rehabilitation activities, movement and transportations practiced by heavy machinery unpaved surfaces generate particulate emissions such as dust that can affect the local air quality. Fugitive dust emissions could disturb many receptors including workers and the residents of Minieh-Danniyeh especially where the proposed roads pass through populated residential areas in Sir and Al Sfireh villages (L4-MD-RD6). Also some of the proposed roads are located near fruit trees of figs, apples and pears (L4-MD-RD6). As such, this type of vegetation will be disturbed by the different rehabilitation activities and all the resulting emissions. The generated emissions include dust and particulate matter that accumulate at the surface of the leaves thus affecting the photosynthesis process. The significance of dust emissions is highly dependent on the wind conditions during the rehabilitation phase. Open burning of solid waste or other material on site could release emissions accompanied by toxins. It is worth to mention that some of the road sections in Minieh-Danniyeh caza require new pavement. At these stations identified in Section 3.2, the impact on the air quality will be higher than at sections where only patching and overlay is required.

The road sections in Minieh-Danniyeh Caza that require new pavement are as follows:

- Station 5Km 500m - 5Km 900m and 7km 340m – 8km 160m of L4-MD-RD 4
- Station 300m – 1km 210, 2km 600m – 3km and 5km 200m – 5km 530m of L4-MD-RD 6

As such, during rehabilitation, the impact on the air quality in the area of the proposed project is evaluated as negative (N).

As for odor emissions during the rehabilitation phase, the improper storage and disposal of solid wastes and the accidental liquid waste leakages will lead to odor emissions.

Thus the generation of odor emissions during rehabilitation is considered a neutral impact (O).

Noise

Noise will be generated during the rehabilitation of the proposed roads and its associated works. These activities include transportation or delivery of raw materials, trucks movement, concrete mixing, excavation, and operation of heavy vehicle movement such as excavators, stabilizers, pneumatic drills and stone crushers. All these activities require heavy construction machineries and onsite equipment. A list of major machineries and equipment along with their noise levels decibels (dB) is shown in Table 5-1.

Table 5-1: Noise levels emitted from Construction Machinery and Equipment

Machinery/Equipment	Noise Level at 16 m (50 ft) from source in dB (A)
Loader	80
Concrete Mixer Truck	85
Dump Truck	84
Pile Driver	95
Excavator	80
Pneumatic tyred roller	85

Source: Knauer et al., 2006

Therefore, noise from rehabilitation will likely temporarily disturb the workers and town residents of Sir and Al Sfreh villages as these are densely populated. Noise from rehabilitation will also affect the animals and birds that use the area for foraging and breeding. However, noise levels are highly dependent on the extent and duration of the rehabilitation activities and are temporary and specific to the rehabilitation phase.

Moreover, during the rehabilitation phase of the project roads, the machinery lights and artificial lights might be used in the periods of insufficient natural lights. This might disturb the passers-by, people living in the residential areas as well as animals that might pass. However, this will likely be temporary as the rehabilitation works won't be extended to the night period.

Thus the generation of nuisances-noise and lights is considered a negative impact (N).

5.3.3 Use of Natural Resources

5.3.3.1 Water Consumption

Water is needed for different processes in the rehabilitation activities. It is needed for concrete mixing, cleaning of tools and the used machinery, dust suppression, and earth works activities. Water consumption in the rehabilitation site may be overused causing overexploitation of water resources. This impact is evaluated as negative (N).

5.3.3.2 Natural Material Sourcing

The proposed project requires the use of borrow material such as aggregates and sand. As such, the excavation of lands for the extraction of borrow material may result in removal of land resource. This leads to the change in the morphology of the land. Also in some cases the change might be severe whereby the soil loses its fertile top layer affecting the productivity of the area. Hence this impact is high negative in nature (N). It is worth to mention that no illegal quarries will be used by local contractors to provide the project with the required borrow material.

5.3.4 Land Cover

The rehabilitation of the proposed roads will not change the land use of the area since the roads already exist and the REP aim is to rehabilitate it. However, at certain sections vegetation cover may be removed to be replaced by the rehabilitated sidewalks or retaining walls thus losing some of the vegetation around the proposed roads. It is worth to mention that this vegetation cover is not of significant importance, thus this impact is evaluated as neutral (O).

5.3.5 Biological Environment (Flora and Fauna)

As mentioned in Section 4.2.5, during the site visits, many trees were observed such as the pine trees, oaks and Cypress trees that were planted near residencies. However, these trees are not expected to be affected during project rehabilitation. In addition, most of the area is dominated by a natural green cover and some fruit trees such as pears and apples were witnesses along the project road. These trees will also not be affected by the rehabilitation activities as none of these trees are located on the road sides but are planted in lands at proximity but outside the road delimitations. Moreover, none of these trees gender is considered as endangered. Moreover, a riparian vegetation that includes reed species is available on the banks of Naher El Bared.

However, trees will not be removed within the area of the proposed project. In addition, the main rehabilitation activities that may have a negative effect on the study area flora are the activities of

heavy machinery movement on unpaved roads and removal of deteriorated asphalt layers. However, the tree species mentioned above were observed away from the road alignment. As such the dust generated from these activities will not have a significant impact on the flora in the project area. It is worth to mention that the rehabilitation phase is a short-term phase and the impacts of such activities will disappear as soon as the work is completed.

The impact of the rehabilitation activities is therefore assessed as neutral (O).

As for the fauna, no animals were identified during the site visits. However, the animals that are present in the area and may approach or cross the proposed roads have the tendency to escape due to the noise and vibrations emanating from the undertaken activities and be disturbed. Nevertheless, this phase is temporary and the disturbance impact will diminish as soon as this phase ends. This impact is considered negative (N).

5.3.6 Visual Intrusion

As mentioned previously this project will not change the landscape of the area since the roads already exist. However, the project contractor will try to the extent possible to prevent visual intrusion for nearby people during the rehabilitation works. This impact is temporary and will diminish as soon as the project is completed and is considered as a neutral impact (O).

5.4 Potential Socioeconomic Impacts during Rehabilitation

5.4.1 Labour Influx

Sexual abuse and exploitation (SEA) induced by labor influx and sexual harassment (SH) in the workplace are potential gender-associated impacts that may arise during the project rehabilitation phase. These impacts will most likely occur due to labor mobilization and the unfamiliar cultural and social settings. Moreover, social interactions between workers living in the area (in rented apartments), surrounding communities, local vendors and sellers can cause culturally insensitive behavior and relationships leading to sexual abuse and exploitation incidents (GGITR & GTGDR, 2018). This impact is considered to be negative (N).

5.4.2 Traffic

As a results of the proposed rehabilitation activities, on site traffic management may pose a challenge on the proposed roads. Moreover, the movement of heavy machinery and construction activities may lead to temporary traffic jam or might result in accidents and cause inconvenience to the people using those roads. In addition, traffic could be disrupted by the rehabilitation activities throughout traffic diversions, detours or blockage. As mentioned before, the location of these detours will be specified by the contractor during the rehabilitation phase. However, these impacts are temporary and will vanish as soon as the project is completed. As such, this impact is assessed as a negative impact (N).

5.4.3 Social Tension

Social tensions may arise between local and displaced communities should the former perceive that most the job opportunities created are being offered to foreign workers. In addition, discrimination by the local community of foreign workers residing in residential buildings (in rented apartments) may have a negative impact on the wellbeing of these workers. This impact is considered to be negative (N).

5.4.4 Child Labour

During rehabilitation, it is possible that the contractor may recruit children who are under the legal age as workers on the site, especially in the case of the day laborers. Without proper mitigation and enforcement measures, this impact would be considered as a strongly negative impact (2N).

5.4.5 Cultural Heritage

The project is not expected to result in any impacts on cultural heritage and archaeological sites as the proposed roads are not located near these sites.

5.4.6 Workers Health and Safety

During summer, high temperatures could cause heat stress and dehydration to some of the workers. Accident and injuries to workers and the public may be caused by transportation accidents, falls, electric shock from street light repairing activities, mishandling of machinery and other rehabilitation related accidents. The high noise generated from the machinery could damage the hearing of the workers and dust generation from the different construction activities, movements and transportations may cause respiratory problems for workers on site if appropriate personal protection equipment are not being used. As such most of the health problems that might affect the workers results from the generated air pollutants at the construction site. The following are potential airborne health risks along with the associated construction activity:

- Acute respiratory disorders, lung and heart diseases due to the generation of particulates from vehicular emissions and constructional machinery that operates on fuel as well as silica in dust from the earth agitated by heavy machinery on unpaved roads.
- Acute irritation of the upper airways resulting in coughs and cold from large particulates.
- Acute manifestations including inflammatory conditions like bronchitis, bronchiolitis and pneumonia which may be rapidly fatal from the inhalation of small size particulates (2.5u to 10u).
- Pollutants such as SO₂, NO₂ and CO emitted from vehicular emissions contribute to respiratory ill health.
- Long term exposure is associated with chronic lung diseases such as lung cancer and silicosis (GoG-MRH, 2017).

Other health related effects that area associated with the generation of dust includes irritation of mucous membranes or allergic reactions that might be harmful to the eyes and skin (GoG-MRH, 2017). Thus occupational health and safety impacts for the workers and nearby residents are evaluated as a strongly negative impact (2N).

5.4.7 Public Safety

Residents of villages may be injured as a result of activities associated with the rehabilitation of the proposed roads in the nearby towns. In fact, these activities can lead to car accidents especially when safety and road rerouting signs are not installed properly. Also accidents are more prominent to occur with the local residents who are not familiar with presence of heavy equipment and machinery. Since this impact will vanish as soon as the project is complete, the impact of public safety is considered temporary and negative (N).

5.4.8 Access to Services

During the rehabilitation activities, some of the trade and supply flows of goods will be disturbed in the project area and due to the possible detours and diversions. Moreover, women within the project area might be affected from the presence of rehabilitation activities and workers along the proposed roads. Women might not be able to perform their routinely outdoor activities. The mobility of women working in different fields such as agriculture and livestock may be affected. This impact is therefore considered negative (N).

5.4.9 Economic Activities

As mentioned previously, many shops, restaurants, health centers and car repairing shops were identified along the way and are in close proximity to some road stations especially in the residential areas. For example, along road L4-MD-RD4 there are a school, a health center and three restaurants. As for L4-MD-RD6, the observed features were car maintenance shops and small shops, three Mosques, a minimarket, a small bakery and an entrance to a recreational site (Zahlan Grotto). During the rehabilitation phase, the existing shops might be affected due to potential road closure, presence of excavation activities and heavy machinery near those shops. Thus, this will impact the livelihood of the shops owners. Moreover, the rehabilitation activities will also impact the visitors of the existing recreational site as its entrance was identified on the project road (L4-MD-RD4). This impact is therefore considered negative (N) and temporal as the livelihood will be enhanced once the road is rehabilitated.

5.5 Potential Positive Impacts during Operation

5.5.1 Socioeconomic Environment

5.5.1.1 Economic Activities

Once the project is completed the improved infrastructure will encourage new business opportunities and marketing activities in project region. Moreover, the rehabilitation of roads will improve the standard of living of the local community as it will have a better access to education and healthcare facilities especially for women and children and it will benefit from the new business opportunities. It is also expected that the proposed road rehabilitation project will increase the land values in nearby villages thus allowing land owners to sell their land at an increased prices and start new businesses.

Tourism is expected to increase in the region since the improvement of the road infrastructure conditions in the region will attract more visitors.

As such, this impact economic activities in the region is considered as a strongly positive impact (2P).

5.5.1.2 Traffic and Road Safety

The rehabilitation of the roads including adding adequate traffic signs for stoppage give ways as warning signs, mirrors at sharp edges, and other regulatory and warning signs will improve road conditions resulting in a smoother vehicular movement providing safer conditions for locals and tourists to commute. Thus, this is evaluated as a positive impact (P). This issue is addressed further in Section 5.6.7.

5.5.2 Cultural Heritage

There is no evidence of any historical vestige in the location of the proposed roads. Thus the proposed project will not impact the cultural heritage of the region. However, the improvement of road conditions will enhance touristic activities to historical and archaeological landmarks and the monasteries in the region. Thus it is assessed as a positive impact (P).

5.6 Potential Negative Environmental Impacts during Operation

5.6.1 Water Quality

The rehabilitation of the already existing roads will not have major negative impacts on groundwater and surface water during the operational phase. However, some accidental oil spills might be released from vehicles, oil tankers and infrequent spills in the service areas. Such spills contain high oil and grease content and could be transported through runoff into nearby surface and groundwater bodies during heavy rain events. This impact is occasional and restricted up to the road surface nature.

As such, the impact on the water quality in the area of the proposed project during operation is evaluated as neutral (O).

5.6.2 Air Quality

The rehabilitation of the proposed roads will improve the road condition thus reducing traffic related emissions by inducing a smoother traffic flow in the project area. Nevertheless, in the long run, as business opportunities will increase and different establishments will be newly constructed along the rehabilitated roads traffic levels might increase leading to increased vehicular pollutant levels (CO, NO_x, SO_x, PM₁₀) in the area. The increase of such pollutants in the atmosphere may cause public health risks and other impacts on the environment.

As such, during operation, the impact on the air quality in the area of the proposed project is evaluated as negative (N).

5.6.3 Noise

During the operation, noise is expected to arise due to traffic related noise pollution; vibrations from engines and tires and use of pressure horns. Noise pollution might disturb wildlife and nearby residential areas. This impact is permanent and negative in nature (N).

5.6.4 Use of Natural Resources

5.6.4.1 Energy and Water Consumption

Energy will be consumed during the operation phase for lighting purposes thus slightly contributing in the depletion of natural resources if the new lighting infrastructure was not based on renewable energy. Also in some cases the cleaning of the roads include washing by water thus consuming a significant amount of water. However, this type of cleaning is infrequent and will not cause depletion in the water resources if properly used.

Thus the impact of energy and water consumption is evaluated as a negative impact (N).

5.6.5 Biological Environment

Improving the conditions of the proposed roads will increase the traffic load in the area. As a consequence, if some animals cross the roads they might be exposed to direct mortality or avoidance behaviour. The probability of crossing these roads is higher at night and the possible animal hitting accidents will be lower. However, this impact won't affect drastically the situation as the road and this impact already exist.

As for the terrestrial ecosystem, the increase in traffic will lead to increased exhaust emissions from the vehicles passing through the proposed roads thus affecting the life cycle of the trees and vegetation around the roads.

Thus the impact on the biological environment is evaluated as a negative impact (N).

5.6.6 Visual intrusion

As the project is the rehabilitation of existing roads in Minieh-Danniyeh Caza, the surrounding environment, vegetation, and the aesthetical value of the surrounding areas is not likely to be significantly affected.

5.6.7 Traffic and Road Safety

After the rehabilitation of the proposed roads an increase in traffic rates will occur as people will frequently use the rehabilitated roads. In addition, improving the conditions of the road will lead to enhanced vehicular movement and speed thus increasing the chances of road accidents. However, installing safety walls, safety signs, speed limit signs and speed bumps along the proposed roads will decrease the possibility of such accidents and protect pedestrians. In addition, the law enforcement in Lebanon is not always implemented in the country and limited law enforcement is anticipated in Minieh-Danniyeh. As such, this impact is evaluated as negative (N).

5.7 Summary of Potential Impacts

After evaluating the potential negative and positive impacts that might arise from the proposed project during both phases (rehabilitation and operation), it was concluded that most of the negative impacts will occur during the rehabilitation phase. These impacts are mainly related to the disruption of nearby residents from the rehabilitation activities along with some impacts on the surrounding environment such as deterioration of soil and water quality if the generated wastewater and solid waste were not managed properly. In addition to the negative impact on the air quality that might arise as a result of heavy rehabilitation activities especially where new pavement is proposed for the roads. On the other hand, job opportunities will be created to the local community during the rehabilitation. It is worth to mention that these impacts are short in term and will diminish as soon as the project is completed. As for the operational phase, the assessed socioeconomic impacts were mostly positive in nature in terms of livelihood improvement within the project area. However, on the long term the proposed project will contribute in increasing vehicular pollutant levels (CO, NO_x, SO_x, PM₁₀) in the area as well as traffic related noise causing public health problems and other impacts on the environment. Table 5-2 and Table 5-3 summarize the impacts during the rehabilitation and operations phases.

Table 5-2: Summary of Impacts during Rehabilitation Phase

Impact	Media	Nature
Environmental		
Air pollution from emissions of machinery, trucks or open burning activities	Air, nearby communities and workers	N
Dust pollution from rehabilitation and excavation activities	Air, nearby communities	N
Noise pollution a result of transportation or delivery of raw materials, trucks movement, concrete mixing, drilling, construction and operation of heavy vehicle movement such as excavators	Nearby communities and workers	N
Disturbance of nearby areas and animal escape from noise and vibrations	Biodiversity and sensitive habitats	N
Contamination of surface water from improper disposal of wastewater from workers, water coming from cleaning of machines and equipment Reduction in overall surface water quality due to improper disposal of construction waste Water pollution due to accidental spill of oils and chemicals	Water resources, soil, nearby communities	N
Contamination of soil from accidental spills of oils and chemicals on the soil from machines and trucks and from transportation of chemicals and oils	Soil, subsoil and land	N
Improper disposal of cut volume may cause contamination of water bodies in rainy weather	Water resources	N
Surface water and soil pollution from improper disposal of solid waste generated from workers and the used materials, construction waste from excavation and drilling activities	Water resources, soil, subsoil and land	N
High consumption rates of electricity, fossil fuel, etc. contributing to overconsumption and depletion of fuel	Energy resources	N
High consumption rates of water for construction related activities	Water resources	N
Over extraction of borrowing material and depletion of natural resources (sand, aggregates, ...)	Soil, subsoil and land	N
Tree and floral species disturbance near the site during rehabilitation activities	Biodiversity and sensitive habitats	O
Disturbance of animals in the area	Biodiversity and sensitive habitats	N
Socioeconomic		
Creation of job opportunities for local communities	Labor influx, socio-economic activities	P
Local garages will benefit from the equipment oil maintenance and residents will benefit from the rent fees of the offices and the equipment parking area.	Nearby communities, socio-economic activities	P
Discrimination from the local community against the foreign workers	Foreign Workers	N
Social tensions as a result of perception that foreign workers being offered a major proportion of the jobs created by the project	Local and foreign workers	N
Child labor for construction activities	Local and foreign children	2N
Traffic congestion in the concerned towns due to transport of construction materials, the material that may fall or due to temporal road closure	Nearby communities, socio-economic activities	N
Potential occurrence of sexual abuse and exploitation incidents induced by labor influx	Nearby communities	N
Disruption of local community to access services due to construction activities and temporal road closure	Nearby communities and socio-economic activities	N
Disruption to access to shops as a result of rehabilitation activities and temporary road closure thus affecting	Shop's owners and Zahlan Grotto recreational site visitors	N

Impact	Media	Nature
livelihood of shop's owners and the recreational site visitors		
Community and Occupational Health and Safety		
Material falling from vehicles during transport may cause traffic accidents or congestion	Nearby communities	N
Accident and injuries to workers because of construction activities (mainly respiratory health risks)	Workers	2N
Dust generation and noise may cause health related problems to nearby residents	Nearby communities	N
Injuries from car accidents due to the presence of construction sites and closure of some roads	Nearby communities	N

Table 5-3: Summary of Impacts during Operation Phase

Impact	Media	Nature
Environmental		
Increased vehicular pollutant levels in the area causing public health risks and other impacts on the environment	Air, Nearby communities	N
Noise pollution from traffic related noise pollution; vibrations from engines and tires and use of pressure horns disturbing wildlife and nearby residential areas	Nearby communities, biodiversity and sensitive habitats	N
Depletion of natural resources (fuel) used for street lighting purposes	Energy resources	N
Disruption of animals movement leading to direct mortality or avoidance behavior as a result of increased traffic load in the area	Biodiversity and sensitive habitats	N
Possible oil spills events transported through runoff and polluting nearby surface and groundwater bodies	Water resources, soil, subsoil and land, nearby communities	O
Socioeconomic		
Encouragement of new business opportunities, and marketing activities in project region, the increase in land values and facilitate the access to services and improve the living standards	Socio-economic activities, nearby communities	2P
Improvement in road conditions due to installation of proper safety signs	Socio-economic activities, nearby communities	P
Enhancement of tourism	Socio-economic activities, nearby communities	P
Community and Occupational Health and Safety		
Accident occurrence due to the enhancement of vehicular movement resulting from the improvement of road conditions	Nearby communities	N

6. MITIGATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

This section outlines the measures required in order to mitigate all impacts identified in Section 5 as well as ensure proper monitoring. These measures have been included in an Environmental and Social Management Plan (ESMP).

6.1 Environmental Mitigation Measures during Rehabilitation

6.1.1 Soils and Water Quality

The contractor should install temporary structures (i.e. barriers) to prevent runoff from reaching nearby water bodies such as Naher El Bared and Oyoun El Samak Lake near L4-MD-RD4 and avoid working in rainy weather. Also the contractor should ensure that the volume of cut will be disposed properly during the rehabilitation phase in controlled disposal site to be identified by the contractor in coordination with the relevant municipality. As for the wastewater generated from the workers on site, it is important to ensure the installation of the porta cabin toilets. These toilets should be connected to the existing network or to the polyethylene tank if sewerage network is not available within the project site. The collected wastewater in the polyethylene tank should be discharged into nearby operational wastewater treatment plants. In addition, the discharge of wastewater into nearby water bodies (Naher El Bared river and Oyoun EL Samak Lake) should be prohibited under any condition.

6.1.2 Air Quality

In order to reduce the project's impact on air quality, the following mitigation measures must be implemented:

- Vehicles, equipment and machinery used for during rehabilitation should be regularly maintained;
- Open burning of solid waste must be prohibited;
- Vehicles must move at a low speed on unpaved;
- Loading of raw material should be done under dust preventive measures (i.e. water sprinkling);
- Raw material storage areas should be covered;
- Water should be sprinkled in order to suppress dust. During windy weathers, dust generating activities should be stopped;
- Transported material should be covered.

6.1.3 Noise

In order to reduce and control the noise generated during the rehabilitation phase especially in residential areas, the following mitigation measures must be implemented:

- Regular maintenance of all noisy equipment and machinery. This includes changing lubricants, replacing damaged parts, and installing mufflers;
- Drilling and excavation activities should be executed only during working hours;
- Heavy machinery such as percussion hammers and pneumatic drills should not be used during the night without prior approval of the municipality or client.

6.1.4 Use of Natural Resources

Several mitigation measures can be implemented in an effort to reduce natural resource depletion and consumption. These measures include:

- Reduce water wastage whenever possible;
- Whenever possible, use dry-cleaning instead wet cleaning;
- Training and awareness should be raised to workers concerning water usage best practices and water conservation;
- Water use for construction activities should be obtained in such a way that doesn't disturb the water availability and supply to the existing communities;
- The light in the offices must be shut down during the night when offices are not in use;
- Machinery and equipment must be turned off when not in use;
- Avoid agriculture land for borrow materials;
- Ensure that the borrow material are extracted from legal quarrying sites.

6.1.5 Land Resources and Biological Environment

As mentioned earlier, the flora within the project site will not be affected significantly, however, landscape areas within the project site must be preserved as much as possible. Moreover, solid waste disposal and any rehabilitation activity should be prohibited near Lazzab Dannieh nature reserve, which is around 2 km away from project area. This can be done by following a guideline developed for that purpose.

As for the fauna, the following mitigation measures must be implemented:

- Maintenance of vehicles and machinery;
- Minimize noise by insulating machinery through installation of mufflers;
- Drilling, excavation and any other noisy activity only during working hours.

6.1.6 Visual Intrusion

Although visual intrusion during the rehabilitation phase is temporary and will diminish at project completion, some mitigation measures must be implemented during this phase to minimize the impact of visual intrusion on nearby residents. These measures include:

- All sources of light must be shut down during night time to avoid disturbance from light pollution at night;
- Green landscape areas must be preserved whenever possible.

6.2 Environmental Mitigation Measures during Operation

6.2.1 Water and Soil Quality

The rehabilitation of the already existing roads will have minimal negative impacts on groundwater and surface water during the operational phase. However, local authorities are responsible for maintaining the storm water network collection system in order to prevent the storm water runoff carrying pollutants, deposits and residues from road surfaces and reaching at the end surface and groundwater water resources and soil. It is recommended to maintain this system especially before the start of the rainy season and continually collect solid waste in order to prevent the blockage of the drainage system.

6.2.2 Air Quality

The following mitigation measures must be implemented in order to reduce traffic related pollutant emissions:

- Ensure that the road is regularly maintained to ensure good surface conditions;
- Fixing speed limit along then roads.

6.2.3 Noise

Mitigation measures that should be implemented in order to minimize the traffic related noise sound signs should be placed near sensitive areas to prevent people from using the pressure horns.

6.2.4 Use of Natural Resources

The following mitigation measures must be implemented in order to reduce the impact on natural resources:

- Use of eco-friendly light bulbs as during the operation phase of the project this will reduce the consumption of energy;
- Cleaning activities that requires a lot of water must be replaced by dry cleaning techniques.

6.2.5 Biological Environment and Land Resources

In order to minimize the impact on the existing biological environment the following must be implemented:

- Install signs such as speed limit signs and animal crossing signs at areas where animals (i.e. cats, sheep, goats, dogs) cross from one side of the road to another.
- Prohibit solid waste disposal into nearby areas and avoid practicing any project rehabilitation activities especially near the Lazzab Dannieh nature reserve

6.2.6 Visual Intrusion

As the project is the rehabilitation of existing roads in Minieh-Danniyeh caza, the surrounding environment, vegetation, and the aesthetical value of the surrounding areas is not likely to be significantly affected. Hence no mitigation measures are proposed.

6.3 Social Mitigation Measures during Rehabilitation

6.3.1 Socioeconomic

6.3.1.1 Economic Activities

The proposed project is considered to have a positive impact on the economical profile of the local community. In order to enhance this impact, priority of hiring should be giving to qualified local residents, especially for skilled and professional jobs. In addition, the contractor must abide by the following mitigation measures to prevent any disturbance to the local community:

- Warn the staff strictly not to involve in any unethical activities and to obey the local standards and cultural norms

- Select specific timings for the construction activities especially near residential areas in accordance with MOE Decision 52/1 for 1996 (National Environmental Quality Standards).
- Ensure that the generated solid waste and liquid waste is disposed or discharged of in an environmentally friendly way and in selected areas.

Moreover, as mentioned earlier, the owners of the identified shops along the project area and the visitors of the recreational site, the medical center, the school and the Mosques within the project site will be affected during the rehabilitation phase. Some mitigation measures must be implemented during this phase to minimize this impact such as:

- Install temporary structures (wooden boards) from the road to the shops and the visited places such as Mosques, medical center and the school in case access to them was blocked
- Proper installation of sign boards
- Timely completion of the rehabilitation phase

6.3.1.2 Labor Influx

Furthermore, in order to reduce the risk of sexual abuse and exploitation induced by labor influx and sexual harassment as much as possible, the contractor should implement the following prior to project rehabilitation:

- Draft Codes of Conduct and the guidelines for a Gender Based Violence (GBV) and Violence Against Children (VAC) Action Plan;
- Ensure that workers at the rehabilitation site sign the Code of Conduct, presented in annex 2 that targets GBV risks, specifically Sexual Exploitation and Abuse and/or Sexual Harassment induced by labor influx, and penalizes the perpetrators of GBV
- All workers including contractor, foreign workers and international consultants should sign codes of conduct written in a language that is appropriate;
- All workers are committed to prevent and report sexual abuse and exploitation incidents within the work site and in its immediate surrounding communities;

Respond to the reported incidents as a matter of priority. The contractor should coordinate with a service provider in this regard;

6.3.1.3 Social Tensions

The following mitigation measures must be implemented in order to minimize the social tension between local and foreign workers during the rehabilitation works:

- Conduct awareness campaigns for the local community regarding foreign workers' influx and how their engagement can affect the local economic sector in a positive way. Also these campaigns must inform the local community that these workers will sign code of conduct before stating the work and thus their behavior will be controlled.
- Ensure that all workers (locals and foreign, skilled and unskilled) will be compensated equally as per the scale of market price rates and have equal contractual benefits and working conditions.
- Ensure GRM is accessible to local communities including all relevant stakeholders who can use this mechanism to send their suggestions, concerns and complaints.

6.3.1.4 Child Labor

The following mitigation measure must be implemented in order to ensure that the contractor will not recruit children who are under the legal age as workers on the site, especially in the case of the day laborers:

- Daily registrations of workers and verification of their age to prevent child labor
- Abide by the Labor Law and ensure that workers below 18 years are not engaged in construction works
- Ensure the contractor is aware of the penalties that Labor Law is imposing in the case of child labor
- The contractor should follow a code of labor practice that details the policy for hiring individuals and that prevents child labor

6.3.1.5 Traffic

The following mitigation measures must be implemented in to order minimize the traffic congestion and resident's inconvenience during the rehabilitation of the roads:

- Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage;
- Install proper warning;
- A flagman should be positioned on the proposed roads to warn the passing cars and ensure the traffic is not blocked;
- Coordinate with the municipality police to help in traffic management;
- Vehicles carrying construction materials will be restricted during the daytime;
- The contractor should also ensure that the transported material by the trucks is well covered.

6.3.2 Public and Worker Health and Safety

6.3.2.1 Personal Protective Equipment and Worker Safety

The contractor should ensure workers safety from any possible accident. Workers should wear personal protective equipment (PPE) and the contractor should supplement the working site by a first aid kit:

- Workers should wear hard hats to avoid any potential objects fall or accidental head contact with electrical hazards.
- Safety glasses should be worn during construction phase in order to avoid the exposure to flying particles or harmful chemicals.
- Workers should wear the right gloves to protect their hands. Different type of gloves could be used according to the undertaken construction activity.
- Boots with slip-resistant and puncture-resistant soles should be worn by the workers on construction site
- The contractor should abide by the assigned work schedule (OSHA, 2011)

6.3.2.2 Electrical Safety

The following mitigation measures must be implemented in order to minimize electrical hazards and accidents:

- The electrical activities and working on new and existing hot electrical circuits should be prohibited if all power is still turned on.

- All frayed, damaged or worn electrical cords or cables should be replaced and flexible cords and cables should be protected from damage.
- All electrical tools and equipment should be maintained and checked regularly for any defect.

6.3.2.3 Public Safety

Local residents' safety and passers-by should be ensured as well. For this purpose, the following mitigation measures must be implemented:

- Proper safety and diversion signs must be installed at sensitive areas within the project area (i.e. near schools)
- Training of heavy machinery drivers about road safety
- Inform the local community about the construction schedule and abide by assigned timing
- Install pedestrian and vehicular passages near residential areas Accidental oil spillage shall be well controlled
- Develop a site-specific Public Health and Safety Plan and Occupational Health and Safety
- Apply Best Applicable Practices on Road Safety

6.3.3 Access to Services

In case the works imply the temporary closure of some of the busy roads within the project site, traffic shall be secured via alternative routes to reach relevant destinations not to disturb the routinely activities of the local community including women, students and traders.

6.3.4 Cultural Heritage

The proposed project is located within an area that does not include cultural heritage and archaeological site. However, unknown artefacts may be uncovered during drilling activities. If any archaeological finding was therefore suspected during this phase, work should be halted immediately and the Directorate General of Antiquities must be informed.

6.4 Social Mitigation Measures during Operation

The socioeconomic conditions of the area where the proposed roads are rehabilitated will be improved positively. However, public health and safety should always be ensured through applying the best practices on road safety along the rehabilitated roads.

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

7.1 Institutional Setup and Capacity Building

7.1.1 National Institutions

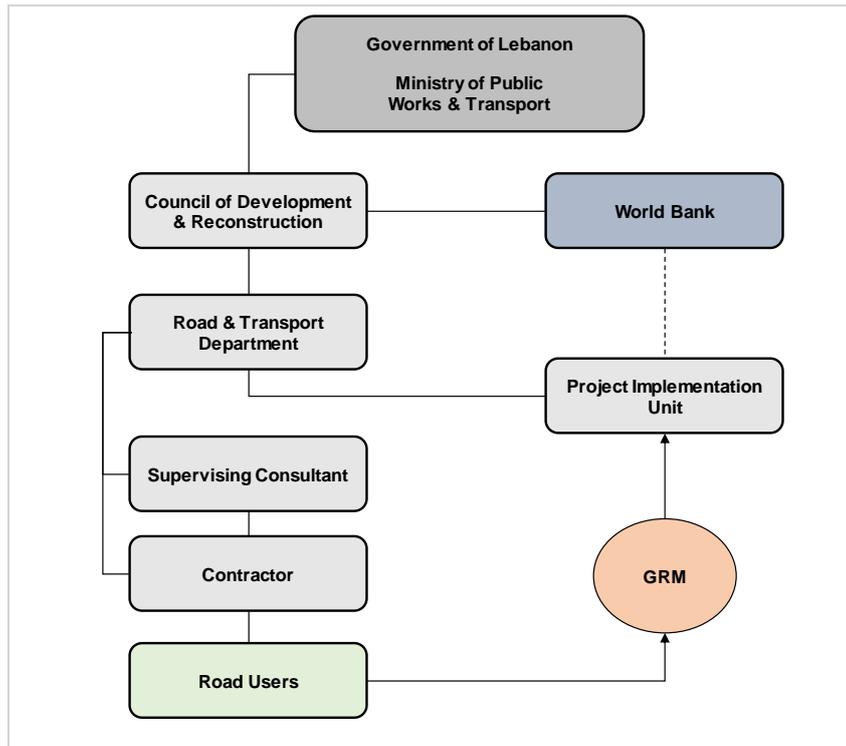
The project works will be executed on the main road network which is under the jurisdiction of the MOPWT. In Lebanon, donor-funded road works projects are implemented by CDR upon the request of the Council of Ministers (COM). Therefore, in the context of REP project, CDR (Road and Transport Department) will execute the project on behalf of the Government/MOPWT.

In order to achieve proper environmental management and monitoring, a clear, functional institutional structure was defined (refer to Figure 7 1). During the rehabilitation phase, the contractor would be the primary actor; ensuring compliance of works with the different items specified in the environmental and social management plan. Accordingly, the contractor will be supervised by several entities appointed by CDR. CDR will be responsible for constant monitoring of the rehabilitation works through weekly and/or monthly reports (sent by the contractor) and site visits, ensuring and enforcing mitigation measures.

More specifically, the CDR will develop a Project Implementation Unit (PIU) dedicated to the project, which includes social and environmental specialists to monitor and evaluate the project. Moreover, it will engage a supervising consultant to directly monitor the contractor. In this context, planning, implementation and supervision of environmental safeguards will thus take place at different stages (a) PIU, (b) Supervising Consultant, and (c) Contractor.

PIU will be responsible for providing the overall plan direction, technical support, appraisal and validation of environmental and social management plans, and monitoring of environmental compliance and progress reporting to the World Bank. The responsibility of implementation and management of environmental/social safeguards by the PIU will be coupled with the assignment of supervising consultant (focal point(s) for environmental and social safeguards) who will be in charge of ensuring sound application of the ESMP. Finally, implementation of the ESMPs will mainly be the Supervising Engineer duty and consequently the Supervising Engineer will have to appoint qualified environmental, health and safety consultant and a social development consultant in order to ensure that the Contractor is compliant with the ESMPs during the rehabilitation phase of the project.

The main concerned municipalities will be involved in managing and communicating local community's potential complaints to the CDR (PIU) through the Grievance Readiness Mechanism (GRM) process.

Figure 7-1: Roads and Employment Project Management Structure

7.1.2 Training

In the context of the proposed project, the supervising consultant will prepare environmental and social training course (environmental management, health and safety issues) prior to the handover of the road project for the contractors and field supervision staff.

The main objective of the training is to:

- Meet regulatory requirements in capacity development in support of road rehabilitation;
- Develop technical and administrative procedures for monitoring air quality, traffic scheme recording accidents number;
- Implement data collection for monitoring activities;
- Establish a continuous improvement process for safety;
- Ensure that staff knows and understands the potential risks associated with road safety;
- Enhance knowledge and skills of municipality employees, enabling them to perform their responsibilities in the areas of health and safety.

Training programs must be incorporated with a feedback loop to ensure their relevance and acceptance by staff and will be reviewed periodically and updated when necessary. The implementation of the training programs will raise awareness to the involved municipalities of the Caza in the following topics:

- Environmental laws, regulations, and standards;
- Traffic and Road Management System;
- Occupational hazard and personal protective equipment;

- Emergency response and chemical spills;
- Sampling techniques and environmental monitoring guidelines;
- Risks associated with road conditions, lack of safety measures and signage;
- Pollution health impacts and prevention measures;
- Operating procedures on the rehabilitated roads (Incident Reporting and Investigation);
- Grievance Redress Mechanism (GRM)
- Codes of Conduct

7.2 Environmental and Social Mitigation Plan

Table 7-1 presents the Environmental Mitigation Plan for road rehabilitation project during the construction and operation phases respectively. The plan for the construction phase should be included in the contractor's tender documents to ensure that all requirements have been taken into consideration by them and will be implemented during the construction phase.

Table 7-1: Environmental Mitigation Plan during Rehabilitation and Operation Phase

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated Cost
Rehabilitation	Environmental Impacts				
	Air pollution from emissions of machinery, trucks or open burning activities	Use properly maintained equipment Abide by a dust management plan Water the ground when extremely windy Mix material in an enclosed space Cover material when transporting	Contractor	Supervision Engineer	4,000 \$
	Dust pollution from rehabilitation and excavation activities				
	Noise pollution a result of transportation or delivery of raw materials, trucks movement, concrete mixing, drilling, construction and operation of heavy vehicle movement such as excavators	Maintenance of vehicles and machinery Excavation and any other noisy activity only during working hours Prohibit solid waste disposal into nearby areas and avoid practicing any project rehabilitation activity near the Lazzab Dannieh nature reserve	Contractor	Supervision Engineer	3,000 \$
	Disturbance of nearby areas and animal escape through noise and vibrations				
	Contamination of surface water and pollution of ground water from improper disposal of wastewater from workers and of wash water coming from cleaning of machines and equipment	Install temporary structures to prevent runoff from reaching nearby water bodies Avoid working in rainy weather Connect the generated wastewater from workers to the sewage network or to polyethylene tank Discharge the pumped wastewater from the polyethylene tank into nearby operational wastewater treatment plants Prohibit the discharge of wastewater into nearby water bodies under any condition	Contractor	Supervision Engineer	5,000 \$
Water pollution due to accidental spill of oils and chemicals from trucks and from	Prepare and abide by a Spill Prevention & Management Plan	Contractor	Supervision Engineer	5,000 \$	

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated Cost
	transportation of chemicals and oils Improper disposal of cut volume may cause contamination of water bodies in rainy weather	Used oil from occasional maintenance of machinery or chemicals must be stored in an appropriate area until it's collected and disposed in a controlled dump site Minimize soil exposure time Proper storage of raw material including chemicals and fuel and handling must be on a paved and sealed floor Regular maintenance of vehicles Minimize the use of chemicals Reuse of excavated material whenever possible Disposal of excavated material in controlled disposal sites			
	Contamination of soil and surface water bodies from the improper disposal of solid waste generated from workers and the used materials, construction waste from excavation and drilling activities	Proper disposal of construction waste in controlled disposal site to be identified by the contractor in coordination with the relevant municipality Proper waste management practices Reuse or recycle the generated waste whenever possible Reuse of excavated material whenever possible Disposal of excavated material in controlled disposal sites to be identified by the contractor in coordination with the relevant municipality Train workers on waste reduction procedures	Contractor	Supervision Engineer	1,500 \$
	High consumption rates of electricity, fossil fuel, etc. contributing to overconsumption and depletion of fuel	Maintenance of the generators and trucks Light in the site offices shut down during the night Construction workers must be trained and provided with awareness sheets on efficient energy use	Contractor	Supervision Engineer	5,000 \$

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated Cost
		Machinery and equipment must be turned off when not in use			
	High consumption rates of water for construction related activities	Use water in the most efficient way and reduce wastage Regular site inspection to detect water leakages	Contractor	Supervision Engineer	5,000 \$
	Reduction in overall ground and surface water quality due to improper disposal of construction waste	Whenever possible, use dry-cleaning instead wet cleaning Training and awareness should be raised to workers concerning water usage best practices and water conservation Proper disposal of construction waste			
	Depletion of natural resources due to the unsustainable extraction of borrowing material (sand, aggregates, ...)	Ensure that the borrow material are extracted from legal sites Avoid agricultural lands to extract borrowing material In case extraction was done from agricultural sites, store the top soil layer for future rehabilitation Rehabilitate the site where excavation was done	Contractor of the quarry site	Supervision Engineer	
Socioeconomic Impacts					
	Temporary Labour Influx	Priority hiring to qualified local community Daily registrations of workers and verification of their age to prevent child labor GRM for local communities	Contractor	Supervision Engineer	-
	Discrimination from the local community against the foreign workers	Conduct awareness campaigns for the local community regarding foreign workers influx Inform the local community that worker will sign code of conduct before stating the work	Contractor	Supervision Engineer	

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated Cost
		GRM for local communities and all relevant stakeholders			
	Possible unequal wage benefits between local and foreign workers	Ensure that all workers (locals and foreign, skilled and unskilled) shall be compensated and are contracted equally as per the scale of market price rates, have equal contractual benefits and working conditions, and have access to GRM	Contractor	Supervision Engineer	-
	Possible recruitment of children who are under the legal age as workers on the site, especially in the case of the day laborers	Daily registrations of workers and verification of their age to prevent child labor Abide by the Labor Law Ensure the contractor is aware of the penalties that Labor Law imposes in the case of child labor Oblige the contractor to strictly abide by the Labor Law through the CDR tender documents that should include prohibition of child labor	Contractor	Supervision Engineer	-
	Disruption of local community to access services due to construction activities and temporal road closures	Traffic shall be secured via alternative routes to reach relevant destinations in case the works imply the temporary closure of this road Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage GRM for surrounding communities	Contractor	Supervision Engineer	-
	Potential occurrence of sexual abuse and exploitation incidents	Draft Codes of Conduct and the guidelines for a GBV and VAC Action Plan All workers should sign codes of conduct written in their native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority	Contractor	Supervision Engineer	

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated Cost
		Training on gender-based aspects, internal and external GRM			
	Slight increase in traffic due to the transport of construction materials or due to the material that may fall	Ensure traffic is not blocked during transportation Inform residents and place signs near the working areas	Contractor	Supervision Engineer	1,500\$
	Traffic congestion in the town due to temporal road closure	Cover transported material Abide by traffic regulations Operate well maintained vehicles			
	Material falling from vehicles during transport may cause traffic accidents or congestion				
	Economic Activities and its effect on the livelihood of the shops owners, the visitors of the recreational site and other visited places	Install temporary structures (wooden boards) from the road to the shops, the recreational site entrance, the medical center, school and Mosques Proper installation of sign boards Timely completion of the rehabilitation phase	Contractor	Supervision Engineer	-
Community and Occupational Health and Safety					
	Accident and injuries to workers and public because of rehabilitation activities	Workers to wear proper safety gear (PPE) Presence of first aid kits (at least three) on the construction site	Contractor	Supervision Engineer	3,000 \$
	Dust generation and noise may cause health related problems for workers and disturbance to residents	Inform residents and place signs near the working areas Proper management of trucks and heavy machinery entering and exiting the construction site Develop a site-specific Public Health and Safety Plan and Occupational Health and Safety Apply Best Applicable Practices on Road Safety			

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated Cost
Operation	Environmental Impacts				
	Increased vehicular pollutant levels (CO, NOx, SOx, PM ₁₀) in the area causing public health risks and other impacts on the environment.	Ensure that the road is regularly maintained to ensure good surface conditions Frequent air quality monitoring must be done along the roads area to ensure that ambient air quality parameters are within the standards	Local authorities	-	3,000 \$
	Noise pollution from traffic related noise pollution; vibrations from engines and tires and use of pressure horns disturbing wildlife and nearby residential areas	Installation of signs near sensitive areas to prevent people from using the pressure horns	Local authorities	-	4,500 \$
	Depletion of natural resources (fuel) used for street lighting purposes	Install eco-friendly light fixtures for the street light infrastructure to reduce the consumption of non-renewable sources of energy	Local authorities	-	Quotation to be provided from local or international suppliers
	Disruption of animals movement leading to direct mortality or avoidance behavior as a result of increased traffic load in the area	Install speed limit and animal crossing signs at areas where animals cross the roads	Local authorities	-	2,500
	Community and Occupational Health and Safety				
	Increased traffic, accidents rates and risk on pedestrians	Apply Best Applicable Practices on Road Safety	Local authorities	-	1,500

7.3 Monitoring Plan

Continuous monitoring during both rehabilitation and operation of the project will be required to ensure the effectiveness of the proposed mitigation measures. Through sound environmental management and implementation of a monitoring plan, the rehabilitation of the roads in Minieh-Danniyeh Caza will avoid incurring the major adverse impacts. The aims of the monitoring plan are:

- Verify the environmental and social impacts predicted in the ESMP study;
- Determine project compliance with national and international requirements and standards;
- Monitor the performance of the project and the effectiveness of mitigation measures;
- Take remedial action if unexpected problems and unanticipated impacts arise.

For additional information, refer to Section 7.3.2 for Reporting and Section 7.1 for Institutional setup and capacity building. Table 7-2 shows the Environmental Monitoring Plan for the rehabilitation and operation phases.

7.3.1 Monitoring Plan Implementation

To ensure implementation of the plan during construction a Health, Safety and Environmental Officer should be appointed on site by the Supervision Engineer at all times and at all the locations of the sensitive receptors that were presented in Figure 4-12.

In order to properly implement the monitoring plan during operation, suitable equipment and technical skills are required. These are necessary to ensure the proper implementation of all proposed mitigations activities that this report recommends. The monitoring plan should be implemented in collaboration with CDR and local authorities.

7.3.2 Documentation and Reporting

7.3.2.1 During Rehabilitation

During the construction phase, regular monitoring results must be documented in order to track and analyze the frequency of potential impacts and accidents that might occur. The project supervision engineer is responsible for the reporting and establishing a comprehensive database for all monitoring activities. The report must include key indicators such as:

- Type of the activity monitored;
- Date of monitoring and weather conditions;
- Photographic documentation;
- Name of the person that is conducting the monitoring;
- Method of monitoring (sampling, visual inspection, ...);
- Number and type of samples;
- Results of the monitoring (concentrations, accidents, frequency, etc.);
- Number of internal and external grievances as per the log
- Code of conduct trainings and number of signed forms

- Dates of trainings
- Mitigation measures undertaken.
- Title and dates of training programs

After documenting, the supervision engineer must submit the reports to the CDR and the WB on a quarterly basis.

7.3.2.2 During Operation

Quarterly environmental monitoring reports should be prepared to analyze the collected data, assess monitoring activities and provide recommendations to ensure the effectiveness of the overall environmental monitoring and management plan during the project life span.

An independent monitoring and evaluation consultant will be responsible for submission of an annual report concerning the different updates of the project status during post-completion phase.

Table 7-2: Environmental and Social Monitoring Plan shows the Environmental Monitoring Plan for the rehabilitation and operation phases.

Table 7-2: Environmental and Social Monitoring Plan

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
Rehabilitation	Environmental Impacts						
	Air pollution (Dust /GHG Emissions)	<ul style="list-style-type: none"> Total Suspended Particles (TSP), PM10, PM2.5 (wherever feasible), SOx, NOx and CO 	Supervision Engineer	Weekly and during activities that generates significant amount of air pollutants	Throughout the project area near sensitive receptors	Visual observation of dust dispersion (scale and direction) and 1-hr and 24-hr measurements when significant amount of air pollutants are generated	\$1,500/event
	Noise Pollution and Light	<ul style="list-style-type: none"> Leq, Lmin and Lmax 	Supervision Engineer	Weekly and during activities generating significant noise levels	Throughout the project area near sensitive receptors	Single sample per location (average 1hr reading- 15min intervals) during morning (7-8am), evening (1-2pm) and night (4-5pm)	\$300 (cost of noise monitoring machine)
Contamination of surface water bodies and soil from the generated domestic wastewater from workers and liquid waste from rehabilitation activities	<ul style="list-style-type: none"> Check for leakages in the connections between the porta cabin toilets and the existing network or polyethylene tank Check the discharge endpoint of the pumped wastewater from the polyethylene tank Effluent from construction activities (Concrete mixing, dust minimizing, washing of equipment...) 	Supervision Engineer	Weekly	Throughout the project area and at the porta cabin toilet sites	Visual inspection	-No Cost	

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	Contamination of surface water bodies and soil from the generated solid waste	<ul style="list-style-type: none"> Ensure active solid waste management plan Construction and demolition waste Waste of the workers on site 	Supervision Engineer	Weekly	Collection points present on sites and near Lazzab Dannieh nature reserve	Visual inspection	-
	Reduction in overall surface water and soil quality Accidental Releases	<ul style="list-style-type: none"> Ensure active spill prevention and management plan Chemicals, oils and fuel spill incidents 	Supervision Engineer	Weekly	Active construction sites	Visual inspection	-
	Depletion of non-renewable energy resources	<ul style="list-style-type: none"> Inspection of the quantities and types of the used fuel and oils 	Supervision Engineer	Weekly	Fuel and oils purchase bills	Visual inspection	-
	Depletion of water resources	<ul style="list-style-type: none"> Inspection of water quantities Monitoring the different drilling and construction activities Ensure active spill and accident prevention plan 	Supervision Engineer	Weekly	Water purchase bills	Visual inspection	-
	Destruction of existing Land Resources	<ul style="list-style-type: none"> Check the infrastructure locations and that excavation works do not interfere with it 	Supervision Engineer	Weekly	In location where excavation and drilling is planned (mainly where new pavement is assigned)	Visual inspection	-
	Tree and floral species disturbance near the site during	<ul style="list-style-type: none"> Site observation 	Supervision Engineer	Weekly	Around proposed roads and near the Lazzab Dannieh nature reserve		-

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost	
	rehabilitation activities							
	Socioeconomic Impacts							
	Traffic congestion	<ul style="list-style-type: none"> Check traffic conditions during transportation of materials Ensure traffic is not blocked Ensure traffic is relocated properly Ensure all safety precautions are abided by 	Supervision Engineer	Daily	Throughout the project area	Visual inspection	-	
	Labor conditions	<ul style="list-style-type: none"> Proportion of Lebanese vs Syrian workers Worker's age GRM log Attendance sheets to GBV trainings Number of workers trained to SEA Number of workers who signed Code of Conduct 	Supervision Engineer	Monthly				
	Labor Influx	<ul style="list-style-type: none"> Number of report Sexual abuse and exploitation (SEA) incidents 	Supervision Engineer	Monthly				
		<ul style="list-style-type: none"> Number of inappropriate communication and language among the workers 	Supervision Engineer	Monthly				
	Community and Occupational Health and Safety							
	Accident and injuries to workers	<ul style="list-style-type: none"> Ensure signs are in place before works begin Visual inspections to ensure that all workers are wearing 	Supervision Engineer	Daily	Along the proposed roads	Visual inspection Accidents records	-	

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
		their PPEs <ul style="list-style-type: none"> Recorded injuries and accidents within the workers 					
	Accident and injuries to the public	<ul style="list-style-type: none"> Ensure the installation of pedestrian and vehicular passages near residential areas Ensure road diversion and construction attention signs are in place before works begin Record injuries and accidents within passers-by Ensure the development of a site-specific Occupational and Public Health and Safety Plan and that the best practices are applied 	Supervision Engineer	Daily	Along the proposed roads	Visual inspection Accidents records	-
Operation	Environmental Impacts						
	Air pollution (dust emissions)	<ul style="list-style-type: none"> Total Suspended Particles (TSP), PM10, PM2.5 (wherever feasible), SOx, NOx and CO 	Local Authorities	Annually	At main receptors along the proposed roads	1-hr and 24-hr measurements, and visual observation of dust dispersion (scale and direction)	\$1,500/ event
	Noise pollution	<ul style="list-style-type: none"> Leq, Lmin and Lmax 	Local Authorities	Bi-Annually	At main receptors along the proposed roads	Single sample per location (average 1hr reading- 15min intervals) during morning (7-8am), evening (1-2pm) and night (4-5pm)	\$300 (price of machine)

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	Community and Occupational Health and Safety						
	Car accidents	<ul style="list-style-type: none"> • Number of car accidents • Cause of accidents • Location of accidents 	Local Authorities	Annually	Along the proposed roads	Records of car accidents, cause of accidents and location of accidents	-

7.3.3 Guidelines for Health and Safety Plan during Rehabilitation

An effective Occupational Health and Safety Plan for construction should include at least the following components:

- Proper signage in and around the site in local languages;
- Fire-fighting measures;
- Guard rails and toe boards on all openings and edges;
- Proper storage and signage of materials including Material Safety Data Sheets;
- Safety measures during demolition works;
- Safety measures according to type of equipment;
- Personal safety equipment;
- Medical services which includes medical examination for all workers, first aid kit and personnel, and keeping logs of all medical records;
- Fencing around the construction site at all times;
- Sanitary facilities (toilet with shower, washing basin, urinal);
- Sanitary facilities to be covered, easily accessible, ventilated, well lit, maintained, and sanitized;
- Safe drinking water in accordance with regulations.

All construction staff should be trained on the Health & Safety Plan and the specific safety measures related to their own activities.

8. CONSULTATION, DISCLOSURE AND GRM

8.1 Public Consultation

A public hearing was held at the union of Danniyeh Municipalities on Wednesday, 16 October 2019. The purpose of the hearing was to inform the stakeholders and the local NGOs about the proposed project that will rehabilitate two roads in Minieh-Danniyeh Caza and their accompanying infrastructural works and to take into account their concerns and feedback. The hearing was organized in coordination with CDR and the union of Danniyeh Municipalities to ensure proper representation of various communities.

During the hearing, the Consultant presented the Project design, preliminary findings of the ESMP study and obtained feedback of the participants in order to include in the report.

Twenty people participated in the meeting including 4 women, two working in the Union of Dannieh Municipalities, one woman is the director of the youth union of Danniyeh and the other is an accountant of an NGO responsible for development. -Participants were informed that a GRM procedure is developed for the project and were given contact information of the Project Consultant in order to inquire about it.

During the session, different concerns were raised by the attendees especially those related to the selection of roads since in their opinion one of the selected roads (Sfeireh-Sir El Dannieh) is not a priority. CDR responded to this comment by noting that the current roads were already selected and approved by the Council of Ministers through a ministerial decision. They added that Sir residents do not take this road (L4-MD-RD6) to reach the main road to travel south. As for the impacts that might result from the rehabilitation of roads, the public does not see any major environmental, health and safety concerns. Employment opportunities were discussed for both Lebanese and Syrian workers. The latter contributes significantly in the construction sector throughout Lebanon including Minieh-Danniyeh Caza. Besides private entities, the municipalities are resorting to Syrian labor in this sector in particular. There appears to be a clear split in job types between the two communities. The delineation line is between skilled jobs (mainly taken by the Lebanese workforce) and unskilled labor (filled primarily by Syrian workers). This split has resulted in a control of potential tensions or conflict between the communities.

Moreover, the women that participated in the women's session stated the following:

- They believe the project will contribute positively to improving women's participation in the economy by making transportation safer and more convenient.
- The women participants also said that working women in agricultural lands (Debaal) do not have any problem with workers being present on the proposed roads near their lands.
- There must be clear coordination mechanism with the municipalities and other authorities during the rehabilitation phase to quickly address potential problems such as burst water or wastewater pipe.

The list of attendees, in addition to the proceedings of the hearing, along with the presentation made to the public hearing participants can be found in Annex 3.

As for NGOs Consultation, this ESMP has targeted them according to their position in Lebanon. They consist of two levels as follows:

- a) Local NGOs: they are specific to each Caza. Their mission is to address different concerns and issues among the local society including social, economic, gender equality, environment, poverty, women empowerment, etc.

Local NGOs were invited to the public hearing that was held at the union of Danniyeh Municipalities on Wednesday, 16 October 2019. Table 8-1 represents the name of the invited NGOs and their field of activity. Those local NGOs may serve as advocates to reduce projects' social and environmental risks and promote good practice.

Table 8-1: Invited NGOs to the Public Hearing and their Activities

Name of the NGOs	Activity
Youth Dialogue in Dinniyeh	It aims to develop the environmental, cultural, tourism and social levels in Dannieh area
Environmental Supporters Society	Protecting the environment and preserving forests
Wadi Al-Zuhour Social Charitable Society	Raising the educational and cultural affairs, paying attention to health affairs, helping the poor and needy people of the village
Al Nahda Social Charitable Society	Social development for vulnerable communities
Nimreen Sports Club	Nimreen Social Club Association is a socio-cultural sporting and agricultural association
Ma Bayna Al Nabeen Society	Carrying out qualifying and training courses on activating citizen participation in developing their society in social, cultural, environmental, economic and agricultural aspects
Project Association for Culture and Development	Develop the cultural and tourism and social sector in the area
Lana Society	The association's goal is to develop the individual and society by spreading knowledge and carrying out the work and activities that contribute to that. The association is particularly concerned with cultural, educational, social, environmental, health and agricultural affairs.

- b) International NGOs: they are covering the whole country and their consultation will be applied to all the ESMPs of the REP. They provide relief and developmental aid to many developing countries. They support the society in responding to crises and helps people whose lives and livelihoods are shattered by conflict and disaster to survive, recover and gain control of their future. When the crisis in Syria erupted in early 2011, numerous International NGOs responded to the humanitarian crisis and worked directly with the Syrian in Lebanon by providing aid and responding to their critical situation. This ESMP consulted International NGOs (see Table 8-2) to inform them about the Project, disseminate it, ask them to circulate its impacts and activities among Syrian and tell them that they can inquire about additional information and/or submit a complaint (if any) by contacting the Grievance Redress Mechanism (GRM) Unit on 01980096 ext:317 or send an Email to rstephan@cdr.gov.lb or register by hand an official letter at the CDR. In Minieh-Danniyeh Caza, the total number of registered Syrian in the villages of the project area is 6,053 individuals (UNHCR, 2019). They were contacted through the International NGOs to seek their feedback about the Project. Accordingly, this ESMP did not receive any concern about the Project. They were contacted through the International NGOs to seek their feedback about the Project. Accordingly, this ESMP did not receive any concern about the Project.

Table 8-2: Consulted International NGOs and their Activities

NGO Name	Contacts	Intervention Sector(s)	Comments
ANERA Lebanon	Mrs. Dima Zayat Deputy Country Director T: 01382590 (ext: 105) M: 70051813 E: dzayat@aneralebanon.org	<ul style="list-style-type: none"> • Children & Youth • Development • Education • Relief Services • Water sanitation and hygiene 	Mrs. Zayat received the Project information sheet and explained that recently Anera operations in Lebanon have grown substantially to cope with the Syrian crisis. they have six offices throughout Lebanon. She welcomed the idea of the Project and will disseminate it across her organization.
ACTED	Mr. Jack French Deputy Country Director T: 01324331 M: 79160375 E: jack.french@acted.org	<ul style="list-style-type: none"> • Development • Infrastructure & Services Rehabilitation • Labor & Livelihoods • Shelter • Water sanitation and hygiene 	Mr. French received the Project information sheet and explained that ACTED is working with Syrian in Beirut and northern districts of Mount Lebanon (Baabda, Metn, Keserwane and Jbeil), as well as in Akkar District. He welcomed the idea of the Project and will disseminate it across his organization.
Danish Refugee Council (DRC)	Mr. Rickard Hartmann Country Director T: 01339052 (ext: 201) E: rickard.hartmann@drc.ngo	<ul style="list-style-type: none"> • Direct Assistance • Protection • Shelter • Community Empowerment and Livelihoods 	Mr. Hartmann received the Project information sheet and explained that DRC is working with Syrian on many sectors in different locations across Lebanon including Beirut, Tripoli, Kobayat and Zahle. He welcomed the

			idea of the Project and will disseminate it across his organization.
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8.2 Grievance Redress Mechanism (GRM)

The purpose of a grievance mechanism is to ensure that all feedback and complaints received from stakeholders, customers, employees, contractor staff and the public in general are documented, considered and addressed in an acceptable and timely manner. It is important to note that this mechanism was shared with the participants and that there is two mechanisms for filing a grievance, one for the surrounding communities and one for the workers a. Anonymous grievances will be addressed in both levels and the maximum anticipated time needed to close a GRM case is 45 days.

8.2.1 GRM for Communities

The GRM will be accessible to all relevant stakeholders who can use this mechanism to send their suggestions, concerns and complaints related to the project. The complaints, suggestions and concerns can be sent by email, mail, phone (through a hotline), in person and other means such as a grievance compliant logging sheet where grievances are registered in writing and maintained as a database. The phone number, e-mail address, and address for receiving complaints will be disclosed among the population and will be posted at the rehabilitation sites in Minieh-Dannieh Caza, before commencement of project implementation. Moreover, the information on how to access the GRM should be available through billboards, CDR website, etc.

The GRM levels of the project are the following (see Figure 8-1):

- Level 1: If any person has any complaint, concern or suggestion regarding the project implementation, he or she can lodge an oral or written grievance through e-mail (GRM.REP@cdr.gov.lb), phone call or text message (01980096 ext:317), or website link (<http://www.cdr.gov.lb/study/RoadsEmp/RoadsEmp.htm>) to the site engineer or manager of the roads to be rehabilitated in Minieh-Dannieh Caza. In case an oral complaint is made, it should be written on paper by the receiving unit. The above issue will be resolved within a maximum duration of one week.
- Level 2: If the person is not satisfied with the action of the site manager's Office, he or she can bring the complaint to the attention of the Social Specialist of the PMU for the project. The issue shall be resolved within a maximum of two weeks.
- Level 3: If the person is not satisfied with the decision of the Social Specialist of PMU, he or she can bring the complaint to the attention of the PMU Director's Office. Once the PMU Director receives the complaint, it needs to be resolved within a maximum of two weeks.

Meanwhile, it is recommended that the aggrieved party is consulted and be informed of the course of action being taken, and when a result may be expected.

Moreover, reporting of the complaints to the PMU should be done on a monthly basis except for urgent cases. The designated person at each level should report to the PMU on the number and subject of new complaints received, and the status of the already existing complaints, if any. The report should also inform the PMU of complaints that could not be resolved at the lower levels and are being elevated to the PMU Director's attention. The PMU aggregates information received into a status report each quarter, indicating the number and subject of complaints. The quarterly status

report also provides up-to-date information on the number and subject of complaints that have been resolved, and the manner in which they have been resolved. This information will be shared with the Bank.

The Complaints Register form (refer to Annex 4) includes the following:

- i) details and nature of the complaint
- ii) the complainant name and their contact details
- iii) date
- iv) Corrective actions taken in response to the complaint.

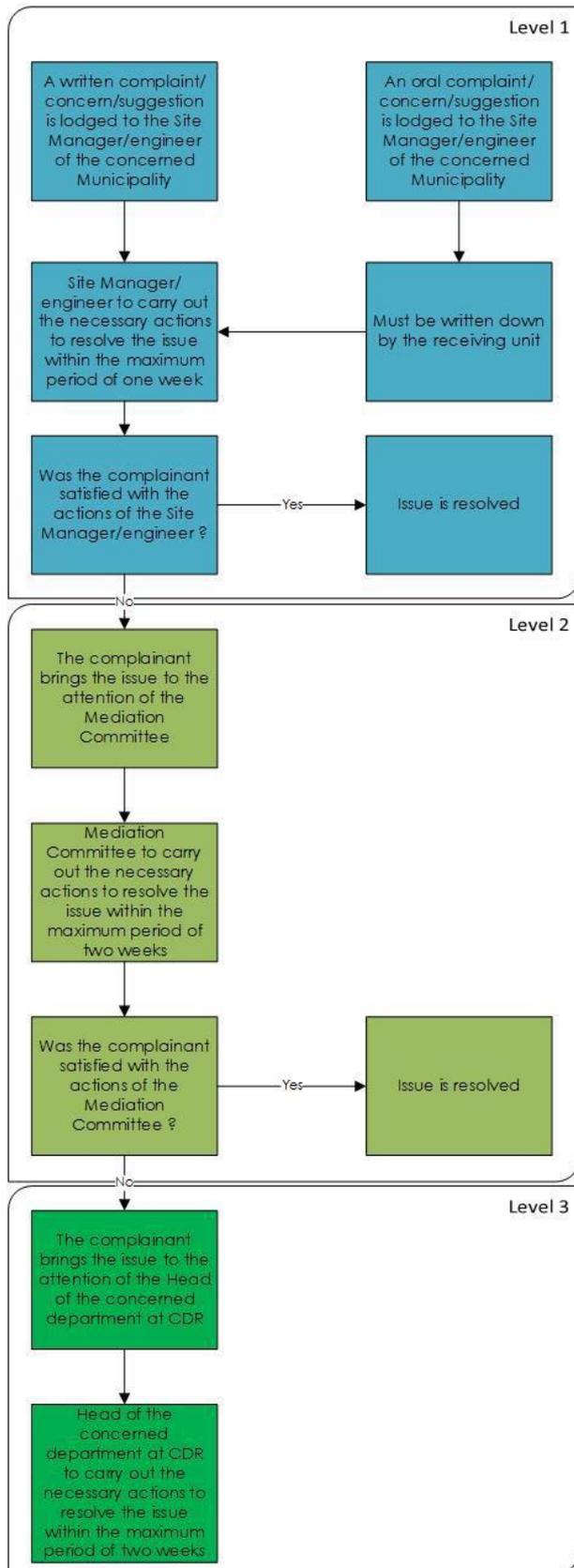
The GRM does not exclude the formal legal process of the national law. If a grievance remains unresolved following application of the project GRM process, the affected person can initiate legal proceedings in accordance with national law and may have recourse to the Appeals Court as warranted.

Figure 8-1 (overleaf) presents a detailed flowchart describing the process of grievance starting from reception of grievance to implementation of corrective measures.

8.2.2 GRM for Workers

A GRM for internal employees, namely the laborers onsite are also necessary. It aims to allow laborers to report any wrongdoings in their favor or important concerns they might have. This internal GRM is similar in nature to the one previously discussed (in terms of accessibility, reporting means, etc...). The only main difference is the contact people for each level. In this context, the first level involves reporting to the health and safety officer and has a duration of one week. The second level involves reporting to the PMU Director and should be resolved within one week. It also follows the Complaints Register form (refer to Annex 4).

Figure 8-1: Grievance Mechanism Process



9. CONCLUSION

After evaluating the potential negative and positive impacts that might arise from the proposed project during both phases (rehabilitation and operation), it was concluded that most of the negative impacts will occur during the rehabilitation phase. These impacts are mainly related to the disruption of nearby residents from the rehabilitation activities along with some impacts on the surrounding environment such as deterioration of soil and water quality if the generated liquid waste and solid waste were not managed properly. In addition to the negative impact on the air quality that might arise as a result of rehabilitation activities especially where new pavement is proposed for the roads.

On the other hand, job opportunities will be created to the local community during the rehabilitation phase. It is worth to mention that these impacts are short in term and will diminish as soon as the project is completed. As for the operational phase, the assessed socioeconomic impacts were mostly positive in nature in terms of traffic and road safety and livelihood improvement within the project area. However, on the long term the proposed project will contribute in increasing vehicular pollutant levels (CO, NO_x, SO_x, PM₁₀) in the area as well as traffic related noise causing public health problems and other impacts on the environment.

However, the negative environmental impacts that might arise from the rehabilitation of the proposed roads in Minieh-Danniyeh Caza can be minimized and even eliminated through proper management and mitigation practices. The proponents of the proposed project are committed to putting in place several measures to mitigate the negative environmental and social impacts associated with the rehabilitation and operation of the proposed project. It is recommended that in addition to this commitment, the proponents shall focus on implementing the measures stated in the ESMP as well as abiding with all relevant national and international policies, standards and regulations.

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ANNEX 1: ENVIRONMENTAL COMPONENTS ALONG THE ROADS

Road	Socio-Economic (Shops, Residential areas, traffic)	Natural Environment (Trees, land use, surface water)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals)
L4-MD-RD4	S100: small houses, local road S250: school S710: local, no traffic S1560: Bridge S1680: restaurant at the right near the river S1760: Overflow of river El Bared, power plant on the river S2410: no traffic S2690: restaurant S2900: restaurant S3450: swimming pool S6560: health center S9000: some small houses scattered	S40: River on the left S410: green areas S710: green areas on both sides S980: river to the left S1730: green areas S1790: green areas, waterfall to the right S1790-S2100: Green areas S2690: still the river is flowing S2900: natural place S3140: river is always flowing to the right of the road S3310: Pristine area S6000-S8560: green areas	S530: Irrigation pond on the left S710: need safety S1240: need safety S1530: Power station S1560-S1610: steel bridge S1730: bridge river S2410: no light S2830: need safety
L4-MD-RD6	S0-S760: Urban, low traffic, narrow roads S200: car maintenance shops to the right S310: small shops and residential buildings to the left S700: Magharat (grotto) Al Zahlan Recreational Site to the left S1000: urban area S2050: Mosque to the left S2000-S3010: village houses S4100-S4500: urban with greens areas next to houses S4500: Mosque S5010: minimarkets to the right of the road S5750: houses to the left of the road S6050: Mosque to the right of the road S6070: small bakery to the right S6850-S7410: urban and narrow road with small shops	S310: green trees (pine and oaks) to the right of the road S600: oak trees to the left S760-S900: Cypress and Oak trees on both sides of the road S1200: green areas on both sides S1300-S1800: figs and oaks S2350-S2460: fruit trees (pears and apples) S2000-S3020: green areas (fruit trees) S3700: green areas S4000: sheep and goat grazing S4710: fruit trees S4850: Water source (Ain) on the left of the road S5350: trees to the left S7600: fruit trees to the right	S0-S700: street lights S250: solid waste bins on the right S1220: waste bins S1000-S3020: water channel to the right of the road S2280: waste bins to then right of the road S2160-s2890: retaining wall S2000-S3010: need street light S3300: street lights S4050: gas station on the left S4800: bus stop S4100-S5010: street lights S5440: bus stop

ANNEX 2: CODE OF CONDUCT

1. Background

The purpose of these *Codes of Conduct and Action Plan to Prevent Gender-based Violence (GBV) and Child Abuse/Exploitation (CAE)* is to introduce a set of key definitions, core Codes of Conduct and guidelines that establish mechanisms for reporting, addressing, monitoring and sanctioning GBV and CAE within the work site and in its immediate surrounding communities.

The Codes of Conduct aim to prevent and/or mitigate the risks of GBV and CAE within the context of Roads and Employment Project for the Government of Lebanon to be funded under the World Bank financed Roads and Employment Project (REP). These Codes of Conduct are to be adopted by the civil works contractors, as well as supervision consultants.

Mutual respect and fair treatment by all parties, that include an understanding on the impact their presence has on the communities living in the areas targeted by the project, are deemed of utmost importance to create a respectful, pleasant and productive work environment. This will help prevent issues with GBV and CAE, thereby guaranteeing a safe environment to work in and around. The Codes also present clear guidelines for sanctions of staff should they be warranted. By ensuring that the project's staff respects the project environment and its communities, a successful attainment of the project objectives will be achieved.

2. Definitions

The following definitions apply:

- **Gender-Based Violence (GBV)** – is defined as any conduct, comment, gesture, or contact perpetrated by an individual (the perpetrator) on the work site or in its surroundings, or in any place that results in, or is likely to result in, physical, sexual or psychological harm or suffering to another individual (the survivor) without his/her consent, including threats of such acts, coercion, or arbitrary deprivations of liberty.
- **Child Abuse and Exploitation (CAE)**– is defined as physical, sexual or psychological harm of minor children (i.e. under the age of 18) including using for profit, labor, sexual gratification, or some other personal or financial advantage. This also includes other activities such as using computers, mobile phones, or video and digital cameras appropriately, and never to exploit or harass children or to access child pornography through any mediums
- **Child Protection (CP)** - An activity or initiative designed to protect children from any form of harm, particularly arising from CAE.

- **Child**- is used interchangeably with the term 'minor' and, in accordance with the United Nations United Nations Glossary on Sexual Exploitation and Abuse, refers to a person under the age of 18
- **Grooming** – is defined as behaviors that make it easier for a perpetrator to procure a child for sexual activity. For example, an offender might build a relationship of trust with the child, and then seek to sexualize that relationship (for example by encouraging romantic feelings or exposing the child to sexual concepts through pornography).
- **Online Grooming**-is the act of sending an electronic message with indecent content to a recipient who the sender believes to be a minor, with the intention of procuring the recipient to engage in or submit to sexual activity with another person, including but not necessarily the sender. For further details, refer to the *Criminal Code Act 1995*, Division 474 (telecommunications offences, subdivision C).
- **Survivor/Survivors**- is defined as the person(s) adversely affected by GBV or CAE. Women, men and children can be survivors of GBV; children of CAE.
- **Perpetrator**- is defined as the person(s) who commit(s) or threaten(s) to commit an act or acts of GBV or CAE.
- **Work site**- is defined its the area in which Roads Rehabilitation works are being conducted, as part of interventions planned under the World-Bank-funded Roads and Employment Project (REP).
- **Work site surroundings**-are defined as the 'Project Area of Influence' which are any area, urban or rural, directly affected by the project, or located within the distance of three kilometres radius from the work site and/or worker's camps, including all human settlements found on it.
- **Consent** – is defined as the informed choice underlying an individual's free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. Any use of a threat to withhold a benefit, or of a promise to provide a benefit, or actual provision of that benefit (monetary and non-monetary), aimed at obtaining an individual's agreement to do something, constitutes an abuse of power; any agreement obtained in presence of an abuse of power shall be considered non-consensual. In accordance with the United Nations, the World Bank considers that consent cannot be given by children under the age of 18, even in the event that national legislation of the country into which the code of conduct is introduced has a lower age Mistaken belief regarding the age of the child and consent from the child is not a defence.

- **Contractor** – is defined as any firm, company, organization or other institution that has been awarded a contract to conduct Roads Rehabilitation works in the context of the Roads and Employment Project (REP) and has hired managers and/or employees to conduct this work.
- **Consultant** – is defined as any firm, company, organization or other institution that has been awarded a contract to provide consulting services in the context of the REP, and has hired managers and/or employees to conduct this work.
- **Manager**- is defined as any individual offering labor to the contractor or consultant, on or off the work site, under a formal employment contract and in exchange for a salary, with responsibility to control or direct the activities of a contractor's team, unit, division or similar, and to supervise and manage a pre-defined number of employees.
- **Employee**- is defined as any individual offering labor to the contractor or consultant on or off the work site, under a formal or informal employment contract or arrangement, typically but not necessarily in exchange for a salary (e.g. including unpaid interns and volunteers), with no responsibility to manage or supervise other employees.
- **Grievance Response Mechanism (GRM)** - the process established by the REP project to receive and address complaints.
- **Standard Reporting Procedure** – is defined as the prescribed procedure to be followed when reporting cases of GBV or CAE.
- **Accountability Measures**- is defined as the measures put in place to ensure the confidentiality of survivors and to hold contractors, consultants and the client responsible for instituting a fair system of addressing cases of GBV and CAE.
- **Response Protocol** – is defined as the mechanisms set in place to respond to cases of GBV and CAE.
- **GBV and CAE Compliance Team:** A team established by the Contractor and/or Consultant to address GBV and CAE issues with the work force.

3. Codes of Conduct

This chapter presents three Codes of Conduct for use:

- **Company Code of Conduct:** Commits the company to addressing GBV and CAE issues;

- **Manager's Code of Conduct:** Commits managers to implementing the Company Code of Conduct, as well as those signed by individuals; and,
- **Individual Code of Conduct:** Code of Conduct for each individual working on REP.

Company Gender Based Violence and Child Abuse/Exploitation Code of Conduct

Contractors and consultants are obliged to create and maintain an environment which prevents gender based violence (GBV) and child abuse/exploitation (CAE) issues, and where the unacceptability of GBV and actions against children are clearly communicated to all those engaged on the project. In order to prevent GBV and CAE, the following core principles and minimum standards of behavior will apply to all employees without exception:

1. GBV or CAE constitutes acts of gross misconduct and are therefore grounds for sanctions, penalties and/or termination of employment. All forms of GBV and CAE including grooming are unacceptable be it on the work site, the work site surroundings, or at worker's camps. Prosecution of those who commit GBV or CAE will be pursued.
2. Treat women and children (persons under the age of 18) with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.
3. Do not use language or behavior towards women or children that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
4. Sexual activity with children under 18-including through digital media-is prohibited. Mistaken belief regarding the age of a child and consent from the child is not a defense.
5. Exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior is prohibited.
6. Sexual interactions between contractor's and consultant's employees at any level and member of the communities surrounding the work place that are not agreed to with full consent by all parties involved in the sexual act are prohibited (see definition of consent above). This includes relationships involving the withholding, promise of actual provision of benefit (monetary or nonmonetary) to community members in exchange for sex- such sexual activity is considered "nonconsensual" within the scope of this Code.
7. Where an employee develops concerns or suspicions regarding acts of GBV or CAE by a fellow worker, whether in the same contracting firm or not, he or she must report such concerns in accordance with Standard Reporting Procedures.
8. All employees are required to attend an induction training course prior to commencing work on site to ensure they are familiar with the GBV and CAE Code of Conduct.
9. All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV and CAE Code of Conduct.
10. All employees will be required to sign an individual Code of Conduct confirming their agreement to support GBV and CAE activities.

Company Gender Based Violence and Child Abuse/Exploitation Code of Conduct

Contractors and consultants are obliged to create and maintain an environment which prevents gender based violence (GBV) and child abuse/exploitation (CAE) issues, and where the unacceptability of GBV and actions against children are clearly communicated to all those engaged on the project. In order to prevent GBV and CAE, the following core principles and minimum standards of behavior will apply to all employees without exception:

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7. Where an employee develops concerns or suspicions regarding acts of GBV or CAE by a fellow worker, whether in the same contracting firm or not, he or she must report such concerns in accordance with Standard Reporting Procedures.
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9. All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV and CAE Code of Conduct.
10. All employees will be required to sign an individual Code of Conduct confirming their agreement to support GBV and CAE activities.

I do hereby acknowledge that I have read the foregoing Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to GBV and CAE. I understand that any action inconsistent with this Code of Conduct or failure to take action mandated by this Code of Conduct may result in disciplinary action.

FOR THE COMPANY

Signed by _____

Title: _____

Date: _____

Manager's Gender Based Violence and Child Protection Code of Conduct

Managers at all levels play an important role in creating and maintaining an environment which prevents GBV and prevents CAE. They need to support and promote the implementation of the Company and Individual Codes of Conduct. To that end, they must adhere to the Manager's Codes of Conduct. This commits them to support and developing systems which maintain a GBV-free and child safe work environment. These responsibilities include but are not limited to:

1. Mobilization

1. Establish a GBV and CAE Compliance Team (GCCT) from the contractor's and consultant's staff to write an Action Plan that will implement the GBV and CAE Codes of Conduct.
2. The Action Plan shall, as a minimum, include the
 - a. **Standard Reporting Procedure** to report GBV and CAE issues through the project Grievance Response Mechanism (GRM);
 - b. **Accountability Measures** which will be taken against perpetrators; and,
 - c. **Response Protocol** applicable to GBV survivors/survivors and perpetrators.
3. Coordinate and monitor the development of the Action Plan and submit for review to the CDR and the PIU safeguards specialist, as well as the World Bank prior to mobilization.
4. Update the Action Plan to reflect feedback and ensure the Action Plan is carried out in its entirety.
5. Provide appropriate resources and training opportunities for capacity building so members of the GCCT feel confident in performing their duties. Participation in the GCCT will be recognized in employee's scope of work and performance evaluations.
6. Ensure that contractor, consultant and client staff are familiar with the REP GRM and that they can use it to anonymously report concerns over GPV and CAE (See Section 4.2 in the Action Plan).
7. Hold quarterly update meetings with the GCCT to discuss ways to strengthen resources and GBV and CAE support for employees and community members.

2. Training

1. All managers are required to attend an induction manager training course prior to commencing work on site to ensure that they are familiar with their roles and responsibilities in upholding the GBV and CAE Codes of Conduct. This training will be separate from the induction training course required of all employees and will provide managers with the necessary understanding and technical support needed to begin to develop the Action Plan for addressing GBV and CAE issues.
2. Provide time during work hours to ensure that direct reports attend the mandatory REP facilitated induction GBV and CAE training required of all employees prior to commencing work on site.
3. Ensure that direct reports attend the monthly mandatory training course required of all employees to combat increased risk of GBV and CAE during civil works.
4. Managers are required to attend and assist with the REP facilitated monthly training courses for all employees. Managers will be required to introduce the trainings and announce the self-evaluations.
5. Collect satisfaction surveys to evaluate training experiences and provide advice on improving the effectiveness of training.

3. Prevention

1. All managers and employees shall receive a clear written statement of the company's requirements with regards to preventing GBV and CAE in addition to the training.

2. Managers must verbally and in writing explain the company and individual codes of conduct to all direct reports.
3. All managers and employees are to sign the individual 'Code of Conduct for GBV and CAE', including acknowledgment that they have read and agree with the code of conduct.
4. To ensure maximum effectiveness of the Codes of Conduct, managers are required to prominently display the Company and Individual Codes of Conduct in clear view in public areas of the work space. Examples of areas include waiting, rest and lobby areas of sites, canteen areas, health clinics.
5. All posted and distributed copies of the Company and Individual Codes of Conduct should be translated into the appropriate language of use in the work site areas (ex. Arabic, French, English).
6. Managers will encourage employees to notify the GRM of any acts of threats or violence to women or children they have witnessed or received, or have been told that another person has witnessed or received, or any breaches of this code of conduct.
7. Managers should also promote internal sensitization initiatives (e.g. workshops, campaigns, on-site demonstrations etc.) throughout the entire duration of their appointment in collaboration with the GCCT and in accordance to the Action Plan.
8. Managers must provide support and resources to the GCCT to create and disseminate the internal sensitization initiatives through the Awareness-raising strategy under the Action Plan.

4. Response

1. Managers will be required to provide input, final decisions and sign off on the **Standard Reporting Procedures** and **Response Protocol** developed by the GCCT as part of the Action Plan.
2. Once signed off, managers will uphold the **Accountability Measures** set forth in the Action Plan to maintain the confidentiality of all employees who report or (allegedly) perpetrate incidences of GBV and CAE (unless a breach of confidentiality is required to protect persons or property from serious harm or where required by law).
3. If a manager develops concerns or suspicions regarding any form of GBV or CAE by one of his/her direct reports, or by an employee working for another contractor on the same work site, s/he shall immediately refer the case to the competent authorities (Police) and, at the same time, report the case to the GRM and the GCCT for internal processing according to the established reporting and accountability measures. Always respecting the survivor's choices if a survivor has been identified.
4. Once a sanction has been determined, the relevant manager(s) is/are expected to be personally responsible for ensuring that the measure is effectively enforced, within a maximum timeframe of 14 days from the date on which the decision was made.
5. Managers failing to comply with such provision can be in turn subject to disciplinary measures, to be determined and enacted by the company's CEO, Managing Director or equivalent highest-ranking manager. Those measures may include:
 - a. Informal warning
 - b. Formal warning
 - c. Additional Training
 - d. Loss of up to one week's salary.
 - e. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
 - f. Termination of employment.
6. Ultimately, failure to effectively respond to GBV and CAE cases on the work site by the contractor's managers or CEO may provide grounds for legal actions by authorities.

I do hereby acknowledge that I have read the foregoing Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to GBV and CAE. I understand that any action inconsistent with this Code of Conduct or failure to take action mandated by this Code of Conduct may result in disciplinary action.

FOR THE EMPLOYER

Signed by _____

Title: _____

Date: _____

ANNEX 3: PUBLIC DISCLOSURE HEARING

**Roads and Employment Project
Public Hearing Session
ESMP for the rehabilitation of Selected Roads in
Minieh-Danniyeh Caza**

Location: Union of Danniyeh Municipalities
Date & Time: 16/10/2019 from 14:00 to 16:00
Attendees: Attendance sheet is attached

Proceedings:

1. Welcome Remarks

The public hearing opened with a word from ACE representative who introduced the overall project and its objectives and relevant organizations including CDR and the World Bank.

2. Presentation

The Environmental Expert from ACE provided a detailed description of the roads and proposed rehabilitation works, purpose of the hearing, EMSP process, World Bank requirements, and listed the potential negative and positive environmental and social issues associated with construction and operation of the project.

3. Discussion

The floor was then opened for discussion and questions. The main issues that were raised are as follows:

- The municipality members of Sfeireh asked if it was possible to add other roads to the two proposed roads in Minieh-Danniyeh caza. CDR and the consultant responded to this comment by noting that the current roads were already selected and approved by the Council of Ministers and the World Bank after a thorough evaluation. However, CDR asked the municipality representatives to raise their concern by sending an official letter to CDR stating the roads that they request to rehabilitate in the caza.
- The President of Danniyeh Municipalities Union noted that he does not foresee that the project would have any negative impact on the environment.
- All municipality representatives (Sfeireh, Debaal, Beit El Faqs, Sir, Qarsaita, Bakhoun, and Btermaz) requested to reconsider the selection of roads since in their opinion one of the selected roads ("Sfeireh-Sir El Danniyeh") is not a priority. The Sir residents stated that they do not take this road (L4-MD-RD6) to reach the main road to travel south. The municipality representatives (Sfeireh, Debaal, Beit El Faqs, Sir, Qarsaita, Bakhoun, and Btermaz) were requesting to complete an already initiated project for the execution of another frequently used road. CDR and the consultant responded to raise their concern by sending an official letter to CDR.

- An attendee of the public hearing raised questions on the timing, budget and transparency issues regarding the proposed roads in Minieh-DanniyeH caza, which were responded to by the consultant and CDR.
- A member of the municipal council (Beit el Faqs) noted some safety issues that need to be addressed regarding one of the selected roads which were documented by the ACE engineer.
- As for the impacts that might result from the rehabilitation of roads, the public does not see any major environmental, health and safety concerns.

4. Women's Session

Following the main discussion, a separate session was held with women who were attending the public hearing. The purpose of the session was to obtain women's feedback on the project and focus on their concerns and suggestions. The main issues raised during this session are as follows:

- Concerns regarding restriction of movement during the construction works due to the influx of workers to the area were not raised by women participants. However, they have indicated that they would prefer that selected workers are Lebanese and residents of the village.
- It was important for all women participants to have a clear coordination mechanism with municipalities during the construction phase to quickly address potential problems, such as a burst water or wastewater pipes.
- Women participants felt that during construction, the project may have a positive impact on women's economic participation through services such as catering provided to the workers.
- After the rehabilitation of the road, women participants felt that the project will contribute positively to improving women's participation in the economy by making transportation safer and more convenient.
- When asked if women working in agricultural lands in Debaal area will be affected during the construction phase, the participants responded that working women in agriculture land do not have any problem with workers being present on the proposed roads near their lands. In fact, the participants said that these working women are cooperative and they always provide food for the workers.
- All women participants asked about the duration of the rehabilitation phase and the nature of works. This was important for them to know if these activities will affect the cleanliness of their houses (dust emissions) that may be in close proximity to the proposed roads.
- Participants were informed that a GRM procedure will be developed for the project and were given contact information of the Project Consultant in order to inquire about it.

Photographic documentation of the public hearing can be found on the following pages.





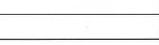


List of Attendees

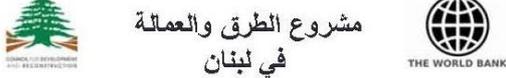

PUBLIC HEARING - ATTENDANCE SHEET الحضور - جلسة مشاركة عامة - المشروع الطرق والعمالة في لبنان
 مشروع الطرق والعمالة في لبنان
 4.2 - Akher
 Damieh

اتحاد بلديات الضنية


Date: 16-Oct-19

الامضاء Signature	الهاتف Telephone	الصفة Position	البلدية Town	المؤسسة Institution	الاسم Name
	08-030858	مدير عمالي عام في اتحاد بلديات الضنية	الضنية	اتحاد بلديات الضنية	كمال الخطيب
	70-151964	مدير فرع الضنية		ACE	عليه الخليل
	70246800	رئيس بلدية العذرة	العذرة	بلدية العذرة	عليه خضر صون
	429859	مختار قنبل	ديبل	ديبل	محمد عبد القادر
	448509	نائب الرئيس	الضنية	بلدية الضنية	محمد الخليل
	70-008966	مدير الشركة	الضنية	شركة MALATCO	خضر لينا
	71060584	Environmental Researcher		ACE	جوليا زويك
	03-929296	Senior Environmental Consultant		ACE	سوزان النسيب
	03/452720	علاء الدين	الضنية	علاء الدين	نادية الامير
	71622865	رئيس اتحاد بلديات الضنية	الضنية	اتحاد بلديات الضنية	رومي فتوح
	41000442	رئيس بلدية	الضنية	بلدية الضنية	محمد صديقي
	71-735974	طبيب باني	الضنية		بشار دود
	83.646113	مجلس العمدة	الضنية	جمعية ما بين الضنية للبيئة	دنيا عيسى
	71-14301	أحمد حيدر النسيب	الضنية	جمعية ما بين الضنية للبيئة	علاء دكهن
	217779	فنانة بلديات الضنية	الضنية	الضنية	فران طاني
	478000	رئيس بلدية الضنية	الضنية	بلدية الضنية	محمد دهن
	428907	مختار	الضنية	بلدية الضنية	عمران الراجول
	71-201211	موظف - عضو لجنة	الضنية	اتحاد بلديات الضنية	امان الخليل
	70-452120	موظف - منقحة	الضنية	اتحاد بلديات الضنية	ضاهر عبيد

Presentation during Public Hearing



مشروع الطرق والعمالة
في لبنان

خطة الإدارة البيئية والاجتماعية

LOT 4
4.1 - قضاء المنية الضنية

جلسة مشاركة العلنية

16/10/2019
الجزء الثانية



نقاط حوار الجلسة

- مقدمة
- أهداف اللقاء
- الجهات المعنية بالمشروع
- مراحل اعداد الخطة البيئية والاجتماعية
- وصف المشروع وأبرز مكوناته
- الاثار البيئية والاجتماعية الايجابية المحتملة للمشروع
- الاثار البيئية والاجتماعية السلبية المحتملة للمشروع
- أسئلة ومناقشة عاتة



مقدمة

- تتمتع شبكة الطرق في لبنان بنطاق وتغطية كافيين بشكل عام
- لكن نسبة كبيرة من تلك الطرق في حالة سيئة وهو الأمر الذي يؤدي إلى إعاقة التنمية المحلية والاقتصادية، خاصة في المناطق الريفية التي تعتبر فيها حالة شبكة الطرق أدنى مستوى من حالة الطرقات على المستوى الوطني ككل



مقدمة

- يخطط مجلس الانماء والاعمار لتنفيذ مشروع الطرق والعمالة في لبنان عبر تمويل من البنك الدولي
- يشمل المشروع أعمال تأهيل عدة طرق في بلدات من كافة الأضية اللبنانية
- يهدف هذا المشروع إلى تحسين كفاءة قطاع الطرق من خلال تحديد أولويات أعمال الطرق وتحسين تقنيات إدارة شبكة الطرق والسلامة العامة



1. أهداف اللقاء

- إعلام الرأي العام بالمشروع لإبداء ملاحظاتهم وفقاً لسياسة ضمانات البنك الدولي (مبلسة تشغيلية رقم 4.01)
- عرض لأهم الاثار البيئية والاجتماعية والتدابير التخفيفية المرتبطة بتنفيذ المشروع
- مشاركة الحضور بمناقشة القضايا المطروحة وطرحهم لقضايا جديدة لم تذكر
- مناقشة خطة الإدارة البيئية والاجتماعية للمشروع



2. الجهات المعنية بالمشروع

الجهة	الصفة
البنك الدولي	ممول المشروع
مجلس الانماء والاعمار	إدارة وتنفيذ
المكتب الهندسي الإستشاري ACE	استشاري هندسي و بيئي



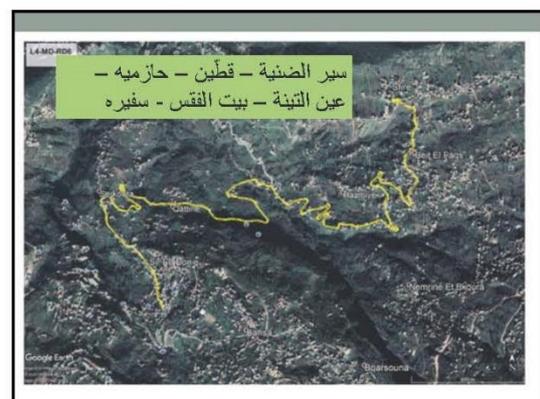


4. وصف المشروع

4.1 الطرق التي سيتم إعادة تأهيلها في قضاء المنية الضنية

- سير الضنية - قطين - حازميه - عين التينة - بيت القفس - سفيره
- دبعل - عيون السمك

مجموع طول الطرق المذكورة أعلاه: 17.4 كيلومتر



4.4 صور لعدة مواقع ضمن المشروع في قضاء المنية الضنية



4.4 صور لعدة مواقع ضمن المشروع في قضاء المنية الضنية



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5. ماذا يتضمن المشروع خلال مرحلة التنفيذ؟

بناءً على الدراسات الهندسية، إن أعمال التأهيل المقترحة خلال مرحلة التنفيذ تضم التالي حسب الخطط الآتية والسلامة العامة:

- تأمين/تأهيل الطبقات الإسفلتية والاسس
- تأمين/تأهيل إشارات سير و تخطيط الطرقات
- تأمين/تأهيل جدران دعم إستثنائية
- تأمين/تأهيل حواجز سلامة جانبية

5. ماذا يتضمن المشروع خلال مرحلة التنفيذ؟

بناءً على الدراسات الهندسية، إن أعمال التأهيل المقترحة خلال مرحلة التنفيذ تضم التالي حسب المتطلبات الفنية والسلامة العامة:

- تأمين/تأهيل أفتية، عبارات لتصريف مياه الأمطار
- تأهيل شبكات إنارة
- تأهيل أرصفة



6. الآثار البيئية والاجتماعية الإيجابية للمشروع

- تقليل الازدحام المروري وتسهيل التنقل في وإلى القضاء
- خلق فرص عمل لأبناء المنطقة والمساهمة في التنمية الاقتصادية المحلية
- المحافظة على السلامة العامة في الطرقات من خلال تقليل حوادث السير والاصطدامات
- تشجيع الشركات المحلية من خلال بيع المواد الخام والآلات والسلع
- ازدهار التنمية الاقتصادية والاجتماعية في المناطق الريفية
- تقليل من تلوث الهواء والغبار



7. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التنفيذ

الآثار المحتملة	النشاط
أضرار على البنية التحتية	أعمال بناء أو إصلاح مجاري مياه الأمطار
ضرر على التنوع الحيوي	قطع الأشجار والنباتات
تلوث التربة والمياه	التخلص غير السليم من النفايات الصلبة
تلوث التربة والمياه	احتمال لحادث حوادث تسرب
التدابير التخفيفية	
• التخلص السليم من النفايات الصلبة الناتجة عن أعمال التنفيذ	
• سيطرة كافة الآليات بشكل دوري لمنع حوادث التسرب	



7. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التنفيذ

الآثار المحتملة	النشاط
زيادة احتمال حوادث السير	حركة الآليات والنمرجات
ضرر على السلامة العامة وسلامة العمال	إبعادات الغبار وزيادة نسبة الضجيج
التدابير التخفيفية	
• إياارة حركة المرور أثناء تنفيذ المشروع وتعيين مرشدين لهداية المارة	
• التأكد من أن الإشارات التحذيرية وألوانه الإنشائية ظاهرة وموجودة في الأماكن المكتظة وبخاصة قرب المدارس والمستشفيات والمناطق التجارية	
• حصر أعمال التنفيذ خلال فترة النهار	



8. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التشغيل

الآثار المحتملة	النشاط
زيادة احتمال حوادث السير	زيادة حركة المرور
زيادة ابعاد ملوثات الهواء والضجيج والارتجاجات	زيادة حركة التنقل على الطرق
تلوث التربة والمياه	زيادة الاسكافيت والتسربيات الناتجة عن المركبات المتحركة
التدابير التخفيفية	
• الصيانة الدورية للطرق	
• صيانة البنية التحتية مع تلافي تأثيرها على الطرق	
• تشكيل حركة مرور المشاحلات الثقيلة بهدف المحافظة على الطريق	



أسئلة ومناقشة عامة

يمكنكم إبداء رأيكم عبر التواصل مع المكتب الهندسي الاستشاري

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شكراً لحضوركم
ومشاركاتكم



ANNEX 4: GRIEVANCE REDRESS MECHANISM (GRM) FORM

Reference No:	
Contact Information Please mark how you wish to be contacted (mail, telephone, e-mail).	<input type="checkbox"/> By Post: Please provide mailing address: _____ _____ _____ <input type="checkbox"/> By Telephone: _____ <input type="checkbox"/> By E-mail _____
Preferred Language for communication	<input type="checkbox"/> Arabic <input type="checkbox"/> English
Description of Incident or Grievance:	
What happened? Where did it happen? Who did it happen to? What is the result of the problem?	
Date of Incident/Grievance	
	<input type="checkbox"/> One time incident/grievance (date _____) <input type="checkbox"/> Happened more than once (how many times? _____) <input type="checkbox"/> On-going (currently experiencing problem)
What would you like to see happen to resolve the problem?	

Signature: _____

Date: _____

GRM Log Book

Name/group of commenter/complainant	Complaint Received date	Description of Issues	Proposed Corrective Actions	Date of Response	Status		
					Solved	Ongoing	Pending