ROADS &
EMPLOYMENT PROJECT

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION

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

LOT 3B

BENT JBEIL - JEZZINE - SAIDA - SOUR

APPENDIX B4

ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP) FOR REHABILITATION OF THE SELECTED ROADS IN JEZZINE CAZA

SEPTEMBER 2020

ASSOCIATED CONSULTING ENGINEERS (ACE)
P.O. BOX 11-3446 - BEIRUT - LEBANON

المكتب الهندسي الاستشاري - (أيس)
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Final Report

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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
CoCs	Codes of Conduct
COM	Council of Ministers
EA	Environmental Assessment
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plans
FHH	Female Headed Household
GBV	Gender Based Violence
GRM	Grievance Redress Mechanism
IBA	Important Bird Area
IFC	International Finance Corporation
ILO	International Labor Organization
LARI	Lebanese Agriculture Research Institute
MOA	Ministry of Agriculture
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
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
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 3 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 Jezzine 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), Ministry of Agriculture (MoA) and the Ministry of Culture (MOC).

The Project is affected by a number of legislations and regulations covering various sectors including Labour, Environment, Health and Safety, Traffic and Antiquity. The most important legal documents are listed below:

- Labor Law/1946: The Lebanese Labor Code
- Law No. 335/2001: Pursuant to the International Labor Organization ILO Convention No 128
- Decree 8987/2012 Prohibition of employment of minors under the age of 18 in work that may harm their health, safety or morals
- Law 80/2018: Integrated Solid Waste Management
- Decree 3791/2016 on Minimum Wage
- Law 444/2002 Framework Law for Environmental Protection
- Decree 8803/2002 and its amendments: Organization of quarries activity, rehabilitation and licensing procedures
- Decree 11802/2008 Occupational prevention, safety, and health in all enterprises subject to the Code of Labor
- Law 166/1933 amended by Law 37 of 2008: Antiquity Law
- Decree-Law 118/1977 on the Municipal Act

- Law243/2012: New Traffic Law
- Legislative Decree 340/1943: Penal Code
- MOA Decision 3/1 of (1997) Establishment of the Bkassine Pine Forest as a protected forest and Hima

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

The World Bank Policy governs the public accessibility of information in the Bank's possession. The World Bank allows access to any information in its possession that is not on a list of exceptions.

In addition, some international conventions and treaties are relevant to the project and are as follows: The United Nations Framework Convention on Climate Change (UNFCC), Convention on Biological Diversity (CBD), and International Labour Organization (ILO) Conventions.

ES3. Description of the Proposed Project

The study area where the proposed roads are located is the Caza of Jezzine of South Lebanon Governorate. The total number of the proposed roads to be rehabilitated under this project is 2 roads with a total length of 15,492 m. 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 land acquisition did not occur during the design of any road under study.

The proposed project consists of the rehabilitation of existing roads in the Caza of Jezzine. 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

The duration of the project is 18 months with a one-year liability period. It is assumed that an estimate total number of workers shall range between 150 and 250.

ES4. Baseline Environmental and Social Conditions

Topography, Geology and Hydrogeology

The Caza of Jezzine is located in the Governorate of South Lebanon and it is about 70 km away from the capital Beirut (IDAL, 2020). Jezzine is the smallest district of the South Lebanon Governorate (IDAL, 2017). The villages of the project area lie between 762 meters to 1,128 meters above sea level (a.s.l). The main geological formation within the study belongs to the following: the Chouf Sandstone formation (C1), the Hammana Formation (C3), the Eocene formation (E2), the Salima Limestone, Portlandian epoch (J7) and the Pleistocene formation (Q). As for the water resources, several water courses are located within the study area along the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. The hydrological maps representing these water courses and watershed are represented in this report.

Climate and Meteorology

The village of Jezzine is located in the Caza of Jezzine, specifically along the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. The average annual temperature in the village is 15.3 °C and the average annual precipitation is 1169 mm (climate-data.org, 2020). The historical climate data (1982-2012) of the village Jezzine were represented in a climograph as well as data obtained (temperature, precipitation, wind direction and wind speed) from the Lebanese Agriculture Research Institute (LARI) nearest meteorological stations located in the village of Machghara and New Nabatieh.

Air Quality and Noise

Ambient air quality of the project area was requested from MOE. Data was available from the UNDP project "Environmental Resources Monitoring in Lebanon 2011-2013" which was conducted across the country including Jezzine. This project was conducted in collaboration with the MoE. The emissions inventory of the Project divided the Lebanese territory into a grid of cells with 5km x 5km each. Annual background average concentrations for criteria pollutants was obtained for each cell. In this project the area surrounding Jezzine is divided into nine cells. For the concerning project, the proposed roads pass through only three cells. The results have shown that the concentrations of NO_2 in all three cells comply with the national standards and the WHO Guidelines. As for the concentrations of PM_{10}, the obtained values were in compliance with the national standards and WHO Guidelines while $PM_{2.5}$ in all three cells were not in compliance with the WHO standards for air quality. Noise measurements that were conducted onsite showed that the average noise level at 2 sites (one residential and another calm area) were within the national standards for noise limits in residential areas.

Land Use/Land Cover

In Jezzine Caza, agricultural activities are seen in different villages as the Caza is characterized with different types of soil and arable lands. The project team has conducted site visits to all the project roads in the Caza of Jezzine in order to collect information about the environmental features along the roads. During the site visits, different kind of trees and areas were observed such as the natural terrains with dense and low vegetation along the roads, in addition to agriculture areas and planted trees. The table below represents the visual classification of land use based on google maps.

Municipality	Land Use

Municipality	Land Use
Azour	Moderately populated with dense trees and vegetation and some agriculture areas
Tiid	Lightly populated with dense trees and vegetation and some agricultural areas
Harf	Scattered houses with dense trees and vegetation and some agricultural areas
Btedine El Laqch	Moderately populated with dense trees and vegetation
Ain Majdlein	Presence of scattered houses with trees, vegetation and some agricultural areas

Biological Environment and Ecologically Sensitive Areas

Jezzine has been known for its pine trees and its agricultural sector (UNDP, 2018). Most of the Jezzine Caza is covered in natural areas. Its location with a variation of elevations, mild climate conditions and different type of soils makes it a distinctive region (IDAL, 2017). The Caza also has important vine yards, vegetable fields and fruit orchards. Trees identified along the proposed roads were mainly Pine trees, Olive trees, Eucalyptus trees, Cypress trees and Oak trees and fruit trees. Land in the Jezzine Caza is also used for significant farming activities and livestock production. The Caza is known for its cattle raising, poultry farming and beekeeping activities.

The Caza of Jezzine hosts Jabal el Rihane which is named as a UNESCO Biosphere Reserve (SOER, 2010), in addition to the 200 Ha Bkassine Pine Forest is listed as a protected forest and Hima (SOER, 2010). Yet, the Jabal el Rihane Reserve is at a distance of 9.4 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. On the other hand, the Bkassine Pine Forest is at a distance of 1.3 km away from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-3). (SOER, 2010). The district also hosts abundant water resources, including the Nahr El Awali and the famous Jezzine waterfall. Yet, during the site visits that was conducted in December 2018, none of these ecologically sensitive areas were identified to be in close proximity to the proposed roads.

Demographic Profile

The Caza of Jezzine, the smallest district of the South Lebanon Governorate (IDAL, 2017), has a population of 25,126 inhabitants, 3,050 and 1,812 of which are registered Syrian Refugees and Palestinian refugees respectively (OCHA, 2016). However, the caza does not host any Palestinian refugee camp. The average household size in the caza is 3.3, the lowest among all the districts, compared to the national average household size in Lebanon of 3.8 individuals (CAS, 2018-2019). The Caza also hosts the largest share of senior persons, 18% compared with the national average of 11% (CAS, 2018-2019). Moreover, the unemployment rate in Jezzine Caza is estimated at 8.3%, less than the national average 11.4% (CAS, 2018-2019). Concerning vulnerable groups, the number of poor[1] Lebanese in Jezzine is 9,125. There is no available information on other groups, such as female headed households (FHH) and people with disabilities,. As for the elderly (seniors above the age of 65), they comprise 18% of the total population in the caza compared with the country's national average of 11% (CAS, 2019). The number of Syrian Refugees within the main villages where the proposed roads pass through is 593(UNHCR, 2019). It is worth mentioning that there are no refugee camps in the area, however, the Syrian refugees in the caza are integrated into the community. The refugees are not expected to be affected by proposed projects.

[1] Poor is referred to people who are living in bad conditions variously described as marginalised, vulnerable, excluded or deprived. People are in poverty when they are deprived of the basic life conditions such as income, diets, material goods, amenities, standards and services (UNDP, 2006)

Economic Activities and Infrastructure

Most of the Jezzine Caza is covered in natural areas. Its location with a variation of elevations, mild climate conditions and different type of soils makes it a distinctive region (IDAL, 2017). The Caza hosts different agricultural activities and produces a variety of agricultural products (IDAL, 2017). The main agricultural activities and products include vegetables, olives, citrus, apples and grapes. The Caza is also well known for its vast pine forests and vineyards. Moreover, the Caza hosts significant cattle raising, poultry farming and beekeeping activities. In addition, the district has been known for and greatly relies on its handicraft industry and food and beverage industry. During the site visits in December 2018, different observations were recorded along the 2 project roads. All these features were described in the report.

During the site visit electricity lines and streetlights were observed along some of the proposed roads. The area also has water supply networks and wastewater collection networks.

Education

Jezzine Caza has a total of 11 public schools, five out of which are located in the Jezzine village. The caza maintains a high literacy rate (98%) which is more than the national literacy rate which is 94%. There are two vocational schools in Jezzine, Jezzine Ecole Agricole technique and Maria Aziz Vocational College, yet students usually attend one of Saida's 8 universities (IDAL, 2017). During the site visits, one educational institution was seen in proximity of the road leading to Ain Majdalein.

Health Services

Within the Caza of Jezzine, the Jezzine village hosts the Jezzine Governmental Hospital which is located in the area lying in between the 2 proposed roads. The hospital is at a distance of 1.2 km from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein and at a distance of 3 km from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3). Yet, no hospitals and medical centers were seen near or in proximity of the proposed roads during the site visits. However, the proposed roads might be used to reach to health care facilities in the area.

Cultural Heritage

Jezzine has been known for its tourist and religious attractions (UNDP, 2018). For example, the Jezzine village hosts many cultural sites such as the Mar Maroun Church, Saydet Al Nabi Church, Evangelical Church, Mar Antonios Church, Saint Coeur Convent, Sports Stadium and a Public Library. In the Azour village there are other cultural sites such as Al-Jamif Citadel and the Old Olive Press. The Btedine El Laqch village is also home to several cultural sites such as Sarcophagi carved in Rocks and the Ruins of an Old Mill (Promenade South Lebanon, n.d.).

As per the Google Maps, there are several churches located in the heart of the Jezzine village are at a distance 1.7 to 2 km away from the proposed road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. However, in the Btedine El Laqch village, there is the Saint Joseph Church which is located at only 0.05 km away from the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3).

During the site visits, six churches were detected by the team along the proposed roads:

- One church at Sta. 2+680 and one church at Sta. 4+000 along the along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1).
- One church at Sta. 1+350, one church at Sta. 1+900, and one church at Sta. 5+650 along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-2).

- One church at Sta. 3+200 along the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

Summary of Baseline

During the site visits conducted in December 2018, different kind of trees and areas were observed such as the natural terrains with dense and low vegetation along the roads, in addition to agriculture areas and planted trees. The economic activities that exist along the proposed roads included small facilities and shops in different fields, restaurants, and car maintenance shops.

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

Summary of Impacts and Mitigation during Rehabilitation Phase

Potential Impact	Proposed Mitigation
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
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 undesignated sites
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
Water pollution due to accidental spill of oils and chemicals from trucks and from transportation of chemicals and oils	Prepare and abide by a Spill Prevention & Management Plan 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 disposal 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 site
Improper disposal of cut volume may cause contamination of water bodies in rainy weather	
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

Potential Impact	Proposed Mitigation
	waste whenever possible Reuse of excavated material whenever possible Disposal of excavated material in controlled disposal site to be identified by the contractor in coordination with the relevant municipality Train workers on waste reduction procedures
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 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 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
Reduction in overall ground and surface water quality due to improper 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
Socioeconomic Impacts	
Temporary potential Labor Influx	Priority hiring to qualified local community GRM for local communities
Economic Activities and its effect on the livelihood of the shop's owners	Install overpass structures from the road to the shops Proper installation of sign boards Maintain a passing corridor within the alignment to grant access to nearby properties Ensure that access to small shops is not blocked by installing wooden boards where necessary Inform the shops' owners ahead of time about rehabilitation date Timely completion of the rehabilitation phase Ensure access to external GRM
Social tensions in the event of potential labor influx due to discrimination from the local community against the foreign workers	Conduct awareness campaigns for the local community regarding the slight potential of foreign workers influx Inform the local community that worker will sign code of conduct before starting the work 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 internal GRM
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
Disruption of local community to access services	Traffic shall be secured via alternative routes to reach

Potential Impact	Proposed Mitigation
due to construction activities and temporal road closures	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 local communities and all relevant stakeholders
Damage of existing infrastructure	Regular coordination with relevant municipalities especially where new infrastructure project such as the installation of new wastewater network are planned Conducting of trial pits
Potential occurrence of gender-based violence and sexual exploitation and abuse incidents	Draft Code of Conduct (CoCs and the guidelines for a GBV and VAC Action Plan All workers should understand, and sign CoC written in their native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority Regular training on gender-based aspects, internal and external GRM Availability of a GRM with multiple channels to initiate a GBV complaint, which ensures confidential reporting with safe and ethical documenting of GBV cases, including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)
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 Ensure communities have access to GRM Cover transported material Abide by traffic regulations Operate well maintained vehicles
Traffic congestion in the town due to temporal road closure	
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 churches	Install overpass structures from the road to the shops and the recreational site entrance and the nearby churches Proper installation of sign boards in culturally appropriate languages and written in clear and understandable manner Timely completion of the rehabilitation phase Ensure access to external GRM
Community and Worker Health and Safety	
Increased traffic, accidents rates and risk on pedestrians	Apply Best Applicable Practices on Road 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 Inform residents and place signs near the working areas and sensitive areas within the project area (i.e. near schools, medical centers, hospitals and shops) Secure the site and restrict access to it Access to hospitals should not be impeded at no time 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
Dust generation and noise may cause health related problems for workers and disturbance to residents	

Summary of Impacts and Mitigation during Operation Phase

Potential Impact	Proposed Mitigation
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
Blockage of drainage systems and overflow of storm water transporting residues and pollutants to nearby water bodies and soils	Ensure that the drainage system is regularly maintained especially before the start of the rainy season and that solid waste is continually collected
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
Depletion of natural resources (fuel) used for street lighting purposes	Install eco-friendly light fixtures for the streetlight infrastructure to reduce the consumption of non-renewable sources of energy
Disruption of animal's 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 were animals cross the roads
Community and WorkerO Health and Safety	
Increased traffic, accidents rates and risk on pedestrians	Apply Best Applicable Practices on Road Safety

ES6.Consultation, Disclosure and GRM

A public hearing was held at the Union of Jezzine Municipalities on Friday, 3 January 2020. The purpose of the hearing was to inform the stakeholders including the municipality representatives, local residents, and the public about the proposed project that will rehabilitate two roads in Jezzine Caza and their accompanying infrastructural works and to take into account their concerns and feedback. A total of Twenty seven people participated in the meeting including 4 women.

During the session, different concerns were raised by the attendees. These are as follows:

- One of the participants asked how will the local community benefit from the proposed project during the rehabilitation phase. Specifically, he asked if CDR would assign contractors from the local community or not. CDR responded by noting that CDR has a list of certified contractors and for this project the contractor must be within this list.
- Questions were raised regarding the origin of the raw material that will be used during the rehabilitation phase. Participants were requesting to purchase the raw material from the local community. CDR responded that if the required raw material is available with the required specifications, the contractor will definitely purchase it from the local community, as he will save more.
- One of the participants raised questions on the timing and budget of the proposed roads in Jezzine caza, which were responded to by the consultant and CDR.
- More than one participant were asking about the criteria that were taken into consideration when selecting the roads. The consultant and CDR responded to this comment by noting that a study was done for the selection of roads taking into account the current conditions of the roads and budget issue. As such, based on this study the current group of roads was selected in Jezzine Caza.

- The head of union of Jezzine municipalities noted that in the future other roads will be rehabilitated in the caza from other sources of funds (EIB, JICA, …)
- It was requested to coordinate with the municipalities before starting the road rehabilitation work not to double the excavation work if the municipality is planning to do any infrastructure project (sewerage networks, electricity cables, etc.…). The head of the union responded to this by noting that a meeting will be held in order to identify all the planned infrastructure projects and determine whether these projects interfere with the rehabilitation of the proposed roads or not. The head of the union ensured that if any infrastructure project interferes with the rehabilitation of the proposed roads, no rehabilitation work will be done before finishing the infrastructure work.
- One of the participants requested to plant some trees along the roads and construct retaining walls. This proposal was taken into consideration as a mitigation measure.
- One of the women mentioned that at one of the proposed roads the retaining wall is in poor conditions. She was asking if this project will cover the rehabilitation of this wall. CDR and the consultant responded by ensuring that this will be covered under the proposed project.

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

- None of the women voiced out any concerns related to restriction of movement during the rehabilitation works due to the potential influx of workers to the area. However, the women felt that it is important to hire local workers in such projects. The consultant said that they will raise this issue to the contractor.
- All women agreed on the fact that the project will affect the cleanliness of their houses during the rehabilitation phase especially if the proposed road passes near residential areas. However, they said that they will be patient during this phase since the end result will be a safer road to pass on. In any case, the contractor should inform residents of the timing of construction works in order to minimize this impact. This measure has already been included in the ESMP.
- All women felt that it is important to install warning signs during the rehabilitation phase to inform the commuters about road closure or rerouting directions. They also ensured that flash lights must be installed at the project site at night. The consultant said this will be to taken into consideration and will ensure that the contractor will implement all safety measures that were proposed in the design
- They believe that during operation, the project will contribute positively to improving the economy in a direct and indirect way.

In general, the public supports this project and do not see any major environmental, health and safety concerns. It was emphasized that clear communication and transparency is needed throughout the project implementation with widely disseminated GRM in place and awareness of GBV and mitigation measures.

As for NGOs Consultation, this ESMP has targeted them according to their position in Lebanon. They consist of two levels as follows: (1) Local: they are specific to each Caza. . Local NGOs were invited to the hearing however only two NGOs attended the meeting. These are Caritas-Jezzine and Mar Mansour Association. Their mission is to address different concerns and issues among the local society including social, economic, gender equality, environment, poverty, women empowerment, etc. They believe this project can have a positive impact if the associated risks, during both construction and operation phases, are minimized and good practices are put in place and (2) International: They are covering the whole country and their consultation will be applied to all the ESMPs of the REP. These contacted international NGOs are ANERA and ACTED. 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.

In addition, it was explained that a formal Grievance Redress Mechanism (GRM) is implemented during both the rehabilitation and operation phases. The purpose of the GRM 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 (45 days). All the attendees of the public hearing were informed about this mechanism. The link to the GRM webpage is as follows: http://www.cdr.gov.lb/study/RoadsEmp/RoadsEmp.htm

ES.7 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, there might also be a negative impact on the traffic movement. 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, in 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 Jezzine 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 الإستشاريّة العالمية الهندسية (ACE)، الاستشاري ، لإعداد خطة إدارة بيئية واجتماعية لـ "Lot 3" في اطار مشروع الطرق والعمالة في لبنان الممولة من البنك الدولي.

يهدف هذا المشروع إلى تحسين قطاع الطرق من طرق ثانوية وفرعية في عدة بلدات من كافة الأقضية 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 والإجتماعية لقضاء جزين، وقد أعدت الدراسة وفقا لسياسة ضمانات البنك الدولي (سياسة تشغيلية رقم ٤,٠١) (التقييم البيئي). هذا المستند يغطي ايضا جميع عناصر المشروع المقترح خلال مرحلة إعادة التأهيل والتشغيل، ويقيم الآثار البيئية والإجتماعية المحتملة من المشروع ، ويحدد التدابير اللازمة للتخفيف من الآثار السلبية وزيادة الأثر الإيجابي على البيئة والموارد الطبيعية من خلال خطة الإجراءات التخفيفية للآثار السلبية. وإضافة إلى ذلك، يتضمن العمل وضع خطة تحديد وسائل الرصد والمراقبة لضمان إمتثال المشروع للأنظمة البيئية والإجتماعية. 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 الزراعة ووزارة الثقافة.
يتأثر المشروع بعدد من التشريعات التي تغطي مختلف القطاعات بما في ذلك العمالة والبيئة والصحة والسلامة والسير والأثار. أهم هذه القوانين مدرجة أدناه:

- قانون العمل / ١٩٤٦: قانون العمل اللبناني
- القانون رقم ٢٠٠١/٣٣٥: عملاً باتفاقية منظمة العمل الدولية رقم ١٢٨
- المرسوم ٢٠١٢/٨٩٨٧ حظر تشغيل القاصرين تحت سن ١٨ سنة في العمل الذي قد يضر بصحتهم أو سلامتهم أو أخلاقهم
- المرسوم ٢٠١٦/٣٧٩١ بشأن الحد الأدنى للأجور
- القانون ٢٠٠٢/٤٤٤ القانون الإطاري لحماية البيئة
- المرسوم ٢٠٠٢/٨٨٠٣ وتعديلاته: تنظيم نشاط المحاجر وإجراءات التأهيل والترخيص
- المرسوم ٢٠٠٨/١١٨٠٢ الوقاية المهنية والسلامة والصحة في جميع الشركات الخاضعة لقانون العمل
- القانون ١٩٣٣/١٦٦ المعدل بالقانون ٣٧ لعام ٢٠٠٨: قانون الآثار
- المرسوم بقانون ١١٨ لسنة ١٩٧٧ بشأن قانون البلديات
- القانون ٢٠١٢/٢٤٣: قانون السير الجديد
- المرسوم التشريعي ١٩٤٣/٣٤٠: قانون العقوبات
- قرار وزارة الزراعة ١٩٩٧/١/٣: تحديد غابة الصنوبر في بكاسين غابة محمية وحمى

سياسات و قوانين 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 أجتماعات الحلقه التشاوريه و عرض النتائج بموجب السياسة التنفيذية رقم٤.٠١.

تحكم سياسة البنك الدولي سهولة وصول الجمهور إلى المعلومات التي بحوزته. يسمح البنك الدولي بالوصول إلى أي معلومات في حوزته ليست مدرجة في قائمة الاستثناءات..

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 التنوع البيولوجي واتفاقيات العمل الدولية.

وصف المشروع المقترح

يقع المشروع المقترح في قضاء جزين في محافظة لبنان الجنوبية. يبلغ مجموع الطرق المقترحة والتي سيتم إعادة تأهيلها في إطار هذا المشروع طريقان يبلغ طولهما الإجمالي ١٥،٤٩٢ متر. جميع الطرق موجودة سابقا وتتطلب إعادة تأهيل لمختلف مكوناتها بما في ذلك من الطبقات الإسفلتية والاساس، الأرصفة، عبارات لتصريف مياه الأمطار و شبكات إنارة. ولقد اختيرت الطرقات من خلال إجتماع مجلس الوزراء رقم ٣٢ بتاريخ ٢٠١٩/٦/٢٧. لم يتم إستملاك أراضي أثناء تصميم أي طريق ضمن المشروع.

يتضمن المشروع المقترح إعادة تأهيل طرق موجودة سابقا في قضاء جزين. 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 واعادة انشاءها من جديد.

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

- تأمين/تأهيل أقنية، 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

تمتد مدة المشروع على فترة ١٨ شهرًا بالإضافة إلى مدة عام واحد لفترة الصيانة. من المفترض أن يتراوح العدد التقديري الإجمالي للعمال بين ١٥٠ و٢٥٠

الوضع البيئي والاجتماعي الحالي

التضاريس والجيولوجيا والهيدروجيولوجيا

يقع قضاء جزين في محافظة جنوب لبنان على بعد ٧٠ كيلومترا تقريبا من العاصمة بيروت. يذكر أن جزين هي أصغر قضاء في محافظة جنوب لبنان. وتقع الطرق في جزين ضمن ارتفاع يتراوح بين ٧٦٢ مترا و ١،١٢٨ مترا فوق مستوى سطح البحر. ينتمي التكوين الجيولوجي الرئيسي داخل منطقة الدراسة إلى ما يلي: Chouf Sandstone (C1), Hammana Formation (C3), Eocene (E2), Salima Limestone, Portlandian epoch (J7) and Pleistocene (Q). وفيما يتعلق بمصادر المياه، توجد عدة مصادر مائية داخل منطقة المشروع خاصة على طول الطرق عازور - تييد - حرف - بتدين اللقش (إلى طريق صيدا – جزين) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3)وطريق (L3-JE-RD01-c) الذي هو تقاطع طريق جزين كفر حونة/عين مجدلين باتجاه طريق عين مجدلين. وضع في هذا التقرير الخرائط الهيدرولوجية التي تمثل هذه المصادر المائية وأحواض المياه.

المناخ والأرصاد الجوية

تقع قرية جزين في قضاء جزين، وتحديدا على طول الطريق (L3-JE-RD01-c) وهي طريق تقاطع جزين كفرحونة/عين مجدلين - باتجاه عين مجدلين. ويبلغ متوسط درجة الحرارة السنوية في القرية ١٥,٣ درجة مئوية، ويبلغ متوسط هطول الأمطار السنوي ١،١٦٩ ملم. ووُضعت البيانات المناخية (١٩٨٢-٢٠١٢) لقرية جزين في رسم بياني

مناخي وكذلك في البيانات (درجة الحرارة والهطول واتجاه الرياح وسرعة الرياح) التي تم الحصول عليها من أقرب محطة أرصاد جوية في قرية مشغرة 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 الإنمائي٢٠١١-٢٠١٣. تم تنفيذ هذا المشروع بالتعاون مع وزارة البيئة حيث تم تقسيم المناطق إلى عدة خلايا (٥ كم × ٥ كم لكل منهما) في العديد من المناطق اللبنانية وضمنها جزين. تم الحصول على متوسط تركيزات الخلفية السنوية للملوثات لكل خلية. في هذا المشروع تنقسم المنطقة المحيطة بجزين إلى تسع خلايا. بالنسبة لمنطقة المشروع المعنية، تمر الطرق المقترحة، بثلاث خلايا فقط. وقد أظهرت النتائج في منطقة المشروع أن تركيزات ثاني أكسيد النيتروجين (NO_2) في جميع الخلايا متوافق مع المعايير الوطنية و معايير منظمة الصحة العالمية. اما فيما يتعلق بتركيزات PM_{10}، أظهرت القيم التي تم الحصول عليها انها متوافقة مع معايير منظمة الصحة العالمية الخاصة بنوعية الهواء لكن لم يكن الحال نفسه لقيم $PM_{٢,٥}$ حيث أن كل الخلايا لم تكن ضمن المعايير. أما بالنسبة لمستوى الضوضاء في المنطقة فقد تبين أن متوسط مستوى الضوضاء في الموقعين التي أجريت فيهم القياسات (أحدهما سكني والآخر هادئ)انها ضمن المعايير الوطنية لمستوى الضوضاء في المناطق السكنية.

غطاء الأرض

توجد في قضاء جزين أنشطة زراعية فى مختلف القرى نظرًا بتميّزأراضيها بأنواع مختلفة من التربة و خوصبة عالية. وقد قام فريق المشروع بزيارة ميدانية إلى جميع طرق المشروع في جزين من أجل جمع المعلومات عن المعالم البيئية على طول الطرق. وخلال زيارة الموقع، تم رصد أنواع مختلفة من الأشجار والمناطق ذات الغطاء النباتي المرتفع والمنخفض على طول الطرق، بالإضافة إلى المناطق الزراعية والأشجار المزروعة. يمثل الجدول التالي التصنيف البصري لاستخدام الأراضي استنادا إلى خرائط جوجل.

البلدية	غطاء الأرض
عازور	ذات كثافة سكانية متوسطة – وجود مناطق زراعية مع غطاء نباتي مرتفع
تيبد	قليلة السكان مع وجود مناطق زراعية – مع غطاء نباتي متوسط
حرف	وجود منازل متفرقة -مغطاة بغطاء نباتي مرتفع- وجود مناطق زراعية
بتدين اللقش	ذات كثافة سكانية متوسطة – مع غطاء نباتي مرتفع
عين مجدلين	وجود منازل متفرقة - مغطاة بغطاء نباتي مرتفع- وجود مناطق زراعية

البيئة البيولوجية والمناطق الحساسة إيكولوجيا

تعرف جزين بأشجار الصنوبر وبقطاعها الزراعي. ومعظم قضاء جزين مغطى بالمناطق الطبيعية. تعتبر جزين منطقة مميزة لاختلاف الارتفاعات فيها واعتدال مناخها ولوجود أنواع مختلفة من التربة .كما يوجد في القضاء حقول و بساتين واسعة من الكروم و الفواكه والخضروات .اما الأشجار التي تم تحديدها على طول الطرق المقترحة فهي أشجار الصنوبر، وأشجار الزيتون، وأشجار الكينا، وأشجار السرو، وأشجار السنديان. كما تستخدم الأراضي في جزين في أنشطة زراعية هامة وإنتاج المواشي. وتشتهر بنشاطات تربية الماشية وتربية الدواجن وتربية النحل.

يجود أيضافي قضاء جزين منطقة جبل الريحان، التي سميت باسم محمية المحيط الحيوي التابعة لليونسكو ، بالإضافة إلى غابة الصنوبرفي بكاسين المدرجة ضمن قائمة الغابات المحمية. ومع ذلك ، تقع محمية جبل الريحان على مسافة ٤.٩ كلم من الطريق (L3-JE-RD01-c) وهو تقاطع طريق جزين كفرحونة / طريق عين مجدلين باتجاه عين مجدلين. من ناحية أخرى ، تقع غابة بكاسين على بعد ١,٣ كلم من الطريق عازور-تعيد-حرف-بتدين اللقش (إلى طريق صيدا جزين) (L3-JE-RD01-a-3).

يتميز القضاء أيضا بموارد مائية وفيرة، منها نهر الاوالي وشلال جزين الشهير. ومع ذلك، لم يلاحظ أي من هذه المناطق الحساسة إيكولوجيا خلال زيارات الموقع لمشاريع الطرق المقترحة.

ومع ذلك ، خلال زيارات الموقع التي أجريت في كانون الأوّل ٢٠١٨ ، لم يتم تحديد أي من هذه المناطق الحساسة بيئيًا بالقرب من الطرق المقترحة.

الديموغرافيا

يبلغ عدد سكان قضاء جزين الذي يعتبر أصغر قضاء في محافظة جنوب لبنان، ٢٥،١٢٦ نسمة، منهم ٣،٠٥٠ و١،٨١٢ لاجئا سوريا وفلسطينيا مسجلين على التوالي. ومع ذلك ، فإن القضاء لا يستضيف أي مخيم للاجئين الفلسطينيين. ويبلغ متوسط حجم الأسرة في القضاء ٣,٣، وهو أدنى مستوى بين جميع الأقضية، مقارنة بالمتوسط حجم الأسرة في لبنان البالغ ٣,٨ فردا ويستضيف القضاء أيضا أكبر حصة من كبار السن، وهي ١٨ في المائة، مقارنة بالمتوسط الوطني البالغ ١١ في المائة. وعلاوة على ذلك، يقدر معدل البطالة في قضاء جزين بنسبة ٣.٨ في المائة، أي أقل من المتوسط الوطني ١١,٤ في المائة . اما فيما يتعلق بالفئات الضعيفة ان أعداد الفقراء في القضاء هي ٩١٢٥ شخص. ولا يوجد معلومات متاحة عن الفئات الأخرى مثل الأسر التي ترأسها امرأة والأشخاص ذوي الحاجات الخاصة. أما كبار السن (كبار السن فوق ٦٥ سنة) فهم يشكلون ١٨٪ من إجمالي السكان في القضاء مقارنة بالمتوسط الوطني البالغ ١١٪.. ويبلغ عدد اللاجئين السوريين في القرى الرئيسية التي يمر بها الطريق المقترح ٥٩٣. لجدير بالذكر أنه لا توجد مخيمات للاجئين في المنطقة ، لكن اللاجئين السوريين في القضاء مندمجين في المجتمع.

الأنشطة الإقتصادية والبنية التحتية

معظم قضاء جزين مغطى بالمناطق الطبيعية. تعتبر جزين منطقة مميزة لاختلاف الارتفاعات فيها و اعتدال مناخها ولوجود أنواع مختلفة من التربة. يستضيف القضاء أنشطة زراعية مختلفة وينتج مجموعة متنوعة من المنتجات الزراعية وتشمل الأنشطة والمنتجات الزراعية الرئيسية مثل الخضروات والزيتون والحمضيات و التفاح والعنب. وتعرف أيضا بغاباتها الواسعة من الصنوبر والكروم. وهناك وجود أأنشطة كبيرة لتربية الماشية وتربية الدواجن وتربية النحل.
وبالإضافة إلى ذلك، كانت المنطقة معروفة وتعتمد اعتمادا كبيرا على صناعتها الحرفية وصناعتها الغذائية والمشروبات.
وخلال زيارة الموقع في كانون الأول ٢٠١٨، سجلت ملاحظات مختلفة على طول طريق المشروع. وقد ورد وصف كل هذه السمات في التقرير.
خلال الزيارة تم ملاحظة خطوط الكهرباء وأضواء الشوارع على طول بعض الطرق المقترحة. كما يوجد بالمنطقة شبكات لإمداد المياه وشبكات لجمع مياه الصرف الصحي.

قطاع التعليم

يوجد في قضاء جزين ١١ مدرسة رسمية، منها ٥ مدارس في قرية جزين. و يحافظ القضاء على نسبة تعليم عالية ، إذ تبلغ نسبة معرفة القراءة والكتابة فيها ٩٨ في المائة، أي أكثر من نسبة معرفة القراءة والكتابة في لبنان التي تبلغ ٩٤ في المائة. توجد مدرستان مهنيتان في جزين" مدرسة جزين التقنية للزراعية "، وكلية ماريا عزيز المهنية، إلا أن الطلاب عادة ما يحضرون واحدة من ٨ جامعات في صيدا. وخلال زيارة الموقع، لم تكن هناك مؤسسات تعليمية على مقربة من الطرق مع ذلك ، يمكن استخدام الطرق المقترحة للوصول إلى المؤسسات التعليمية. وبالتالي ، قد تتأثر الحركة المرورية بسبب أعمال إعادة التأهيل.

قطاع الرعاية الصحية

داخل قضاء جزين، تستضيف قرية جزين مستشفى جزين الحكومي في المنطقة الواقعة بين الطريقين المقترحين. ويقع المستشفى على بعد ١,٢ كيلومتر من الطريق(L3-JE-RD01-c) وهو تقاطع طريق جزين كفرحونا/عين مجدلين باتجاه عين مجدلين وعلى مسافة ٣ كيلومترات من طريق (عازور-تعيد-حرف-بتدين اللقش) إلى طريق صيدا – جزين.(L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3). ومع ذلك، لم يشاهد الفريق أي مستشفيات أو مراكز طبية بالقرب من الطرق المقترحة خلال زيارة الموقع ومع ذلك ، يمكن استخدام الطرق المقترحة للوصول إلى مؤسسات الرعاية الصحية وقد تؤثر أعمال إعادة التأهيل على حركة المرور والوصول إلى هذه المواقع.

التراث الثقافي

عرفت جزين بمعالمها السياحية والدينية. فعلى سبيل المثال، تضم قرية جزين العديد من المواقع الثقافية مثل كنيسة مار مارون، وكنيسة سيدة النبي، والكنيسة الإنجيلية، وكنيسة مار أنطونيوس، ودير القلبين الأقدسين وملعب ومكتبة عامّة.
وفي قرية عازور، توجد مواقع ثقافية أخرى مثل قلعة الجاميف ومعصرة زيتون. كما تضم قرية بتدين اللقش عدة مواقع

ثقافية مثل التابوت الذي نحت في الصخور وآثار الطاحونة القديمة. ووفقا لخرائط جوجل، توجد عدة كنائس تقع في قلب قرية جزين على بعد ١,٧ إلى ٢ كيلومتر من الطريق المقترحL3-JE-RD01-c))، وهو طريق جزين كفرحونا/تقاطع طريق عين مجدلين باتجاه عين مجدلين. ولكن ، في قرية بتدين اللقش، توجد كنيسة القديس يوسف التي تقع على بعد ٠,٠٥ كيلومتر فقط من الطريق المقترح عازور - تييد - حرف - بتدين اللخ (إلى طريق صيدا - جزين)-L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3)
وخلال زيارة الموقع، اكتشف الفريق ستة كنائس على طول طرق المشروع :

- كنيسة واحدة على محطة ٢+٦٨٠ وكنيسة واحدة على محطة ٤+٠٠٠ على طول الطريق عازور - تييد - حرف - بتدين اللقتش (إلى طريق صيدا - جزين)(L3-JE-RD01-a-1)
- كنيسة واحدة على محطة ١+٣٥٠، كنيسة واحدة على محطة ١+٩٠٠، وكنيسة واحدة على محطة ٥+٦٥٠ على طول طريق عازور - تييد - حرف - بتدين اللقتش (إلى طريق صيدا - جزين)-L3-JE-RD01-a-2)
- كنيسة واحدة على محطة ٣+٢٠٠ على طول الطريق (L3-JE-RD01-c) - تقاطع طريق جزين كفرحونا/عين مجدلين باتجاه عين مجدلين.

ملخص الوضع الحالي

وخلال زيارة الموقع في كانون الأول ٢٠١٨، تم تحديد أنواع مختلفة من الأشجار والمناطق ذات الغطاء النباتي الكثيف والمنخفض على طول الطرق، بالإضافة إلى المناطق الزراعية والأشجار المزروعة. وشملت الأنشطة الاقتصادية التي تم تنفيذها على طول الطرق المقترحة منشآت ومتاجر صغيرة في مختلف المجالات، ومطاعم ومحلات لصيانة السيارات.

موجز الآثار البيئية والاجتماعية المحتملة والتدابير التخفيفية خلال مرحلتي إعادة التأهيل والتشغيل

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

الآثار	التدابير التخفيفية
البيئية	
تلوث الهواء الناجم عن انبعاثات الآلات أو الشاحنات أو أنشطة الاحتراق المفتوح	استخدام معدات خاضعة لصيانة بشكل صحيح الالتزام بخطة إدارة الغبار
تلوث الغبار الناجم عن أنشطة إعادة التأهيل والحفر	ري الأرض عندما تكون الرياح شديدة مزج المواد في أمكان مغلقة تغطية المواد عند النقل
تلوث الضوضاء الناجم عن نقل أو المواد الخام وحركة الشاحنات والحفر وتشغيل المركبات الثقيلة مثل الحفارات	صيانة المركبات والآلات حصر الحفر وأي نشاط ضوضائي خلال ساعات العمل فقط
انزعاج الحيوانات والسكان في المنطقة المجاورة من الضوضاء والارتجاجات	حظر التخلص من النفايات الصلبة في مواقع غير مخصصة
تلوث المياه السطحية من جراء التخلص غير السليم من مياه الصرف الصحي من العمال والمياه القادمة من تنظيف الآلات والمعدات	تركيب هياكل مؤقتة لمنع الجريان السطحي للمياه من الوصول إلى المياه السطحية القريبة تجنب العمل في الطقس الممطر شبك 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
تلوث المياه بسبب انسكاب الزيوت والمواد الكيميائية عن طريق الخطأ من الآلات والشاحنات ونقل المواد الكيميائية والزيوت	الاستعداد والالتزام بخطة منع الانسكاب وإدارته تخزين الزيوت المستعملة والناتجة عن صيانة الآلات أو المواد
التخلص غير السليم من كميات الحفر يسبب تلوث المياه في الطقس الممطر	الكيميائية في منطقة مناسبة حتى يتم جمعها والتخلص منها في موقع خاضع للرقابة تقليل وقت التعرض للتربة يجب تخزين المواد الخام بما في ذلك المواد الكيميائية والوقود على أرضية معبدة ومغلقة

الآثار	التدابير التخفيفية
	الصيانة الدورية للمركبات التقليل من استخدام المواد الكيميائية إعادة استخدام المواد المحفورة كلما أمكن ذلك التخلص من المواد المحفورة في المكبات الخاضعة للرقابة
تلوث التربة والمياه السطحية بسبب التخلص غير السليم من النفايات الصلبة الصادرة عن العمال والمواد المستعملة، ومخلفات البناء الناجمة عن أعمال الحفر	التخلص السليم من مخلفات البناء في المكبات الخاضعة للرقابة وتحديدها من قبل المقاول بالتنسيق مع البلدية المعنية إدارة النفايات بالممارسات المناسبة إعادة استخدام أوإعادة تدوير النفايات الناتجة كلما أمكن ذلك إعادة استخدام المواد المحفورة كلما أمكن ذلك التخلص من المواد المحفورة في المكبات الخاضعة للرقابة وتحديدها من قبل المقاول بالتنسيق مع البلدية المعنية تدريب العمال على إجراءات تخفيف النفايات
إرتفاع معدلات إستهلاك الكهرباء مما يسهم في زيادة إستهلاك الوقود واستنفاده	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
إرتفاع معدلات إستهلاك المياه في الأنشطة المتصلة باعادة التأهيل	استخدام المياه بأكثرالطرق كفاءة والتقليل من هدرها فحص الموقع بانتظام للكشف عن أي تسرب للمياه
انخفاض في نوعية المياه الجوفية والسطحية الإجمالية بسبب التخلص غير السليم من نفايات البناء	استخدم التنظيف الجاف بدلاً من التنظيف الرطب كلما أمكن ينبغي رفع مستوى التدريب والتوعية للعاملين بشأن أفضل الممارسات لاستخدام المياه والحفاظ عليها التخلص السليم من مخلفات البناء
إستخراج مواد الخام واستنفاد الموارد الطبيعية (الرمل، البحص، ...)	تأكد من استخراج مواد الخام من المواقع القانونية تجنب الأراضي الزراعية لاستخراج مواد الخام
اقتصادي و اجتماعي	
احتمال تدفق اليد العاملة	إعطاء أولوية التوظيف الى المجتمع المحلي المؤهل آلية مراجعة الشكاوى (GRM) للمجتمعات المحلية
الأنشطة الاقتصادية وأثرها على معيشة أصحاب المحلات	تركيب هياكل مؤقتة من الطريق إلى المحلات التجارية تأكد من عدم حظر الوصول إلى المتاجر الصغيرة من خلال تركيب ألواح خشبية كما يستلزم إبلاغ أصحاب المحلات مسبقًا عن موعد إعادة التأهيل تركيب لوحات الإشارات بشكل صحيح الانتهاء من مرحلة إعادة التأهيل في الوقت المناسب
التوترات الاجتماعية في حالة تدفق العمال بسبب للتمييز من المجتمع المحلي ضد العمال الأجانب	تنظيم حملات توعوية للمجتمع المحلي بشأن احتمال تدفق العمال الأجانب أبلاغ المجتمع المحلي أن العامل سيوقع على على شروط قواعد السلوك قبل ذكر العمل آلية مراجعة الشكاوى (GRM) للمجتمعات المحلية وجميع أصحاب المصلحة المعنيين
توترات إجتماعية نتيجة تصور أن العمال الأجانب يحصلون على نسبة كبيرة من الوظائف التي خلقها المشروع	التأكد أن جميع العمال (السكان المحليين والأجانب ، ذوي المهارات أولا) متعاقد معهم على قدم المساواة وفقًا لجدول أسعار السوق، ولديهم مزايا تعاقدية وظروف عمل متساوية، وإمكانية التأكد من الوصول إلى آلية مراجعة الشكاوى (GRM)
احتمال عمالة الأطفال ما دون السن القانونية في مواقع التأهيل خاصة العاملين في النهار	التسجيلات اليومية للعمال والتحقق من سنهم لمنع عمل الأطفال الالتزام بقانون العمل 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 حظرعمل الأطفال
تعزر وصول المجتمع المحلي إلى الخدمات بسبب أنشطة اعادة التأهيل وإغلاق الطرق مؤقتا	تأمين حركة المرورعبر طرق بديلة للوصول إلى الوجهات ذات الصلة في حال استدعت أعمال التأهيل لإغلاق مؤقت لهذا

الآثار	التدابير التخفيفية
	الطريق إبلاغ المجتمع المحلي عن موقع الطرق المقفلة أو التحويلات من خلال الإعلانات العامة ولافتات التحويل المناسبة آلية مراجعة الشكاوى (GRM) للمجتمعات المحلية وجميع أصحاب المصلحة المعنيين
ضرر على البنية التحتية القائمة	التنسيق المنتظم مع البلديات المعنية خاصة عندما يتم التخطيط لمشروع البنية التحتية الجديدة مثل تركيب شبكة جديدة لمياه الصرف الصحي إجراء حفر تجريبية
احتمال وقوع حوادث عنف قائم على النوع الاجتماعي اعتداء واستغلال جنسي بسبب تدفق اليد العاملة	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 تدريبات منتظمة على الجوانب القائمة على نوع الجنس وآلية مراجعة الشكاوى (GRM) داخلية وخارجية تأكد من توفرآلية مراجعة الشكاوى (GRM) مع قنوات متعددة لبدء شكوى تتعلق بالعنف المبني على النوع الاجتماعي(GBV) ، والتي تضمن إعداد تقارير سرية مع توثيق آمن وأخلاقي لحالات العنف المبني على النوع الاجتماعي ، بما في ذلك الاستغلال والاعتداء الجنسيين (SEA) والتحرش الجنسي (SH)
إزدحام المرور في المناطق المعنية بسبب نقل مواد البناء والمواد التي قد تسقط أو بسبب الإغلاق المؤقت للطرق	التأكد من عدم حظر حركة المرور أثناء النقل إعلام السكان ووضع لافتات بالقرب من مناطق العمل ضمان وصول المجتمعات إلى آلية مراجعة الشكاوى (GRM) تغطية المواد المنقولة الالتزام بقواعد المرور تشغيل المركبات التي تتم صيانتها جيدًا
إزدحام المرور في المناطق المعنية بسبب الإغلاق المؤقت للطرق	
حوادث مرور أو إزدحام نتيجة سقوط مواد من المركبات أثناء النقل	
الأنشطة الاقتصادية وتأثيرها على حياة أصحاب المحال التجارية والزائرين والمواقع الترفيهية والكنائس في المنطقة	تركيب هياكل مؤقتة من الطريق إلى المحلات التجارية ومدخل المواقع الترفيهية والكنائس تركيب لوحات الإشارات بشكل صحيح و باللغات المناسبة الواضحة والمفهومة للمجتمع الانتهاء من مرحلة إعادة التأهيل في الوقت المناسب التأكد من الوصول إلى آلية مراجعة الشكاوى (GRM)
الصحة والسلامة المهنية والمجتمعية	
زيادة حركة المرور ومعدلات الحوادث والمخاطر على المشاة	تطبيق أفضل الممارسات المطبقة على السلامة على الطرق
الحوادث والإصابات التي تلحق بالعمال بسبب أنشطة التأهيل (المخاطر الصحية التنفسية بشكل رئيسي)	على العمال ارتداء معدات الحماية الشخصية (PPE) المناسبة وجود عدّة الإسعافات الأولية (ثلاثة على الأقل) في موقع البناء
توليد الغبار والضوضاء قد يسبب في مشاكل صحية للعمال وللمقيمين القريبين	إعلام السكان ووضع لافتات بالقرب من مناطق العمل والمناطق الحساسة ضمن طرق المشروع (بالقرب من المدارس، المراكز الصحيّة، المستشفيات والمحلات التجارية) ضمانة عدم الوصول الى موقع المشروع لا ينبغي إعاقة الوصول إلى المستشفيات في أي وقت من الأوقات 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

<u>ملخص للآثار البيئية والاجتماعية و الاقتصادية المحتملة والتدابير التخفيفية خلال مرحلة التشغيل:</u>

الآثار	التدابير التخفيفية

الآثار	التدابير التخفيفية
البيئي	
زيادة مستويات تلوث الهواء في المنطقة مما يسبب مخاطر صحية عامة وآثار أخرى على البيئة	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
انسداد شبكات الصرف وتدفق مياه الأمطار الناقلة للملوثات إلى المسطحات المائية والتربة المجاورة	التأكد من أن صيانة نظام الصرف بانتظام خاصة قبل بداية موسم الأمطار وأن النفايات الصلبة تجمع باستمرار
تلوث الضوضاء الناجم عن حركة المركبات وارتجاجاتها واستخدام الأبواق التي تزعج السكان في المناطق السكنية القريبة والحياة البرية	تركيب لافتات بالقرب من المناطق الحساسة لمنع الناس من استخدام أبواق السيارات
استنفاد الموارد الطبيعية (الوقود) المستخدمة لإضاءة الشوارع	تركيب إضاءة صديقة للبيئة لإضاءة الشوارع لتقليل استهلاك مصادر الطاقة غير المتجددة
تعطيل حركة الحيوانات مما يؤدي إلى الموت المباشر أو تجنبها بسبب زيادة حركة مرور المركبات في المنطقة	وضع علامات تحديد السرعة وعلامات عبور الحيوانات في المناطق حيث تعبر الطرق
الصحة والسلامة المهنية والمجتمعية	
زيادة حركة المرور ومعدلات الحوادث والمخاطر على المشاة	تطبيق أفضل الممارسات المطبقة على السلامة على الطرق

اجتماعات الحلقة التشاورية وعرض النتائج

عقدت جلسة مشاركة عامة في اتحاد بلديات جزين يوم الجمعة، ٣ كانون الثاني/يناير ٢٠٢٠. وكان الغرض من هذه الجلسة اهو إبلاغ أصحاب المصلحة (بما في ذلك المنظمات غير الحكومية في منطقة المشروع)، بالمشروع المقترح لإعادة تأهيل طريقان في قضاء جزين وما يصاحبها من أعمال اخرى، ومراعاة ملاحظاتهم. وشارك في الاجتماع ٢٧ شخصا، منهم ٤ سيدات، اثنتان يعملن في القطاع العام في قضاء جزين. خلال الجلسة، أثار الحضور مخاوف مختلفة. سأل المشاركون كيف سيستفيد المجتمع المحلي من المشروع المقترح خلال مرحلة إعادة التأهيل ، و ما إذا كان مجلس الإنماء والإعمار سيعين مقاولين من المجتمع المحلي أم لا. رد مجلس الإنماء والإعمار بالإشارة إلى أن المجلس لديه قائمة بالمقاولين المعتمدين ولهذا المشروع ويجب أن يكون المقاول ضمن هذه القائمة.و قد سأل أكثر من مشارك عن المعايير التي تم أخذها في الاعتبار عند اختيار الطرق. ورد الخبير الاستشاري ومجلس الإنماء والإعمار على هذا التعليق بالإشارة إلى أنه تم إجراء دراسة لاختيار الطرق مع مراعاة الظروف الحال الطرق والميزانية. وأشار رئيس اتحاد بلديات جزين إلى أنه سيتم في المستقبل إعادة تأهيل طرق أخرى في القضاء من مصادر تمويل. وقد طُلب التنسيق مع البلديات قبل البدء في أعمال إعادة تأهيل الطرق لعدم اعادة أعمال الحفر إذا كانت البلدية تخطط للقيام بأي مشروع للبنية التحتية (شبكات الصرف الصحي ، كابلات الكهرباء ، إلخ ...). طلب أحد المشاركين غرس بعض الأشجار على طول الطرق وبناء الجدران الاستنادية خاصة أن الجدار الحاجز في أحد الطرق المقترحة في حالة سيئة. ورد مجلس الإنماء والإعمار والاستشاري بضمان تغطية هذا المشروع المقترح. أما بالنسبة للتأثيرات التي قد تنجم عن إعادة تأهيل الطرق ، فإن الجمهور لا يرى أي مخاوف بيئية وصحية وسلامة. وتم التأكيد على أن التواصل الواضح والشفافية مطلوبان طوال فترة تنفيذ المشروع من خلال نشر آلية إعادة إعمار غزة ونشرها على نطاق واسع والتوعية بالعنف المبني على النوع الاجتماعي وتدابير التخفيف.

بالاضافة، لم تعرب أي من النساء اللواتي شاركن في جلسة عن أي مخاوف بشأن تقييد الحركة أثناء أعمال إعادة التأهيل بسبب احتمال تدفق العمال إلى المنطقة.و اعتقدت المشاركات أنه خلال فترة إعادة التأهيل ، سيسهم المشروع بشكل إيجابي في تحسين اقتصاد المجتمع المحلي. في الواقع ، كانوا يقولون إن العمال سيشترون الطعام والسلع من منطقة المشروع وأنهم قد يستأجرون شققًا خلال مرحلة إعادة التأهيل. اتفقت جميع النساء على حقيقة أن المشروع سيؤثر على نظافة منازلهم خلال مرحلة إعادة التأهيل خاصة إذا مر الطريق المقترح بالقرب من المناطق السكنية. ومع ذلك ، قالوا إنهم سيكونون صبورين خلال هذه المرحلة لأن النتيجة النهائية ستكون طريقًا أكثر أمانًا للمرور..

تمت المشاورات مع المنظمات غير الحكومية في هذه الخطة الإدارية البيئية والاجتماعية وفقًا لموقعها في لبنان وتمثل هذه المنظمات مستويين (١) المحلية: وهي مخصصة لكل قضاء. ولقد دعيت المنظمات غير الحكومية المحلية إلى جلسة الاستماع ، وحضرها فقط كاريتاس-جزين وجمعية مار منصور. وتتمثل مهمتهم في معالجة مختلف القضايا في المجتمع المحلي، بما في ذلك المسائل الاجتماعية والاقتصادية والمساواة بين الجنسين والبيئة والفقر وتمكين المرأة. و يعتقدون أن هذا المشروع يمكن أن يكون له تأثير إيجابي إذا تم تقليل المخاطر المصاحبة ، خلال كل من مرحلتي البناء والتخفيف ،

ووضع الممارسات الجيدة موضع التنفيذ و(٢) الدولية: وهي تغطي كل البلد وستطبق المشاورة معها على جميع الدراسات البيئية لمشاريع الطرق والعمالة في لبنان. يجدر الذكر الى انه عندما اندلعت الأزمة في سوريا في مطلع عام ٢٠١١، إستجابت العديد من المنظمات الدولية غير الحكومية للأزمة الإنسانية وعملت بشكل مباشر مع السوريين في لبنان من خلال تقديم المساعدات والاستجابة لأوضاعهم الحرجة.

وبالإضافة إلى ذلك، نُفذّت آلية مراجعة الشكاوى (GRM) خلال مرحلتي اعادة التأهيل والتشغيل. والغرض من هذا هو ضمان توثيق جميع الملاحظات والشكاوى الواردة من المعنيين والزبائن والمقاول والموظفين وللعامة، والنظر فيها ومعالجتها بطريقة مقبولة وفي الوقت المناسب (٤٥ يوم). بالاضافة، لقد تمّ إبلاغ جميع الحاضرين خلال جلسة المشاركة العامة بهذه الآلية. تم إبلاغ جميع الحاضرين في جلسة المشاركة العامة بهذه الآلية. الرابط إلى صفحة : GRM
http://www.cdr.gov.lb/study/RoadsEmp/RoadsEmp.htm

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 تدهورنوعية التربة و المياه إذا لم تتم إدارة النفايات السائلة والنفايات الصلبة بشكل سليم. اضافة إلى ذلك فهناك أثر سلبي على نوعية الهواء نتيجة أعمال اعادة التأهيل خاصة عند إزالة الطبقات الإسفلتية المتدهور بالكامل و اعادة انشاءها من جديد و قد يكون هناك أيضًا تأثير سلبي على حركة المرور. ومن ناحية أخرى سيتم توفير فرص العمل للمجتمع المحلى خلال مرحلة اعادة التأهيل التى تعتبر اثرا ايجابيا. و لكن تعتبر هذه الآثار قصيرة الأمد وستتقلص بمجرد انهاء المشروع. اما الآثار الاجتماعية والإقتصادية التي تم تقييمها خلال مرحلة التشغيل فهي إيجابية 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 االهواء في المنطقة فضلا عن الضوضاء المتصلة بحركة المرور التي تسبب مشاكل صحية عامة وآثارا أخرى على البيئة. ومع ذلك، يمكن التقليل من الآثار البيئية السلبية التي قد تنشأ عن اعادة تأهيل الطرق المقترحة في قضاء جزين 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 3 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 roads[2] in 25 Cazas[3] 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 Jezzine Caza that is part of Lot 3.

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, repairing street lighting, marking and traffic signing;
- Creating job opportunities for the local community by engaging them in several rehabilitation activities;
- Promoting gender workforce equality to the extent possible through encouragement of employment of both genders within the project.

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

[3]Lebanon is divided administratively into three levels: Governorates (محافظات), 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 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.
- Develop a Grievance Redress Mechanism (GRM)

1.4 Methodology

This ESMP of the REP in Jezzine Caza that is part of Lot 3 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 also included 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 a public hearing in a central location during which stakeholders and local community were invited 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 3 in Jezzine Caza, 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[4] / Decree[5] / Decision[6]	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 disposal 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

[4]Lebanon's legislative body is represented by the Lebanese Parliament that approves and issues Laws.
[5]Lebanon'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.
[6]Decisions 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[4] / Decree[5] / Decision[6]	Title	Relevant Provisions
			prohibited activities and works into the mentioned forests. It also contains offences and penalties
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
1997	MOA Decision 3/1	Establishment of the Bkassine Pine Forest as a protected forest and Hima	The Project area is located nearby the AlHibariye Village at a distance of 1.3 km away from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-3)
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 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			
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	Law 166 amended by law 37 of 2008	Antiquity Law	This law defines heritage and antiquity, identifies its ownership, states legislation for excavation and judicial procedures due to violation

Year	Law[4] / Decree[5] / Decision[6]	Title	Relevant Provisions
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			
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.

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.

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	Management of all public roads, for developing a sustainable strategy for the transportation	Under the MOPWT, the Directorate General of Roads and Buildings is in charge of the design, execution and maintenance of roads, bridges,

Institution	Main Role	Relevant Role
(MOPWT)	sector, road and street plans within cities and villages	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, water conservation and the investment in public and forests	Under decision 476/1 dated 2012 gives permissions for cutting trees for rehabilitation purposes
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

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 for 2001)

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
Total Nitrogen[7]	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[8]	-	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 (NH4+)	-	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 vl+)	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 (Cl2)	-	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 (NO3-)	-	90 mg/l	90 mg/l
Phosphate (POP43-)	-	5 mg/l	5 mg/l

[7] Sum ot Kjeldohl-N (orgcnic N + NH3).NO3-N. NO2-N

[8] 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
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 (µG/M3)
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

2.4.1 Safeguards Policies

The Project activities should comply with two 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 OP 4.01 is triggered as the project could have impacts on the environment due to the rehabilitation of roads infrastructures and associated civil works. Under this policy, this project falls under Category "B" according to the Project Appraisal Document (PAD) and the Environmental and Social Management Framework (ESMF) (CDR, 2018).

Although OP 4.12 was triggered by this project, involuntary resettlement or land acquisition will not take place in the proposed project in Jezzine Caza since they did not occur during the design of any road under study

2.4.2 Access to Information

This Policy governs the public accessibility of information in the WB's possession. The WB allows access to any information in its possession that is not on a list of exceptions.
This Policy is based on five principles:

- Maximizing access to information;
- Setting out a clear list of exceptions;
- Safeguarding the deliberative process;
- Providing clear procedures for making information available; and
- Recognizing requesters' right to an appeals process.

2.4.3 Consultation and Disclosure Policy

According to OP/BP 4.01, 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.

Accordingly, the Consultant organized a public consultation at the union of Jezzine Municipalities on Wednesday, 8 January 2020 (see more details in section 8.1). In addition, this ESMP will be disclosed on the CDR website on the following link https://cdr-lebanon.com/en-US/Studies-and-reports/Roads-and-Employment.aspx.

2.4.4 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 2-7presents 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)	Considers greenhouse gas emissions from REP activities
Convention on Biological Diversity (CBD) - 1992	Ratified through Law No. 360 (1/8/1994)	Considers terrestrial biodiversity in the vicinity of the project.
Convention 120 concerning Hygiene in Commerce and Offices	Ratified by Lebanon in 1977	Protects workers health and ensures proper sanitation and hygiene.
Convention 136 concerning Protection against Hazards of Poisoning Arising from Benzene	Ratified by Lebanon in 2000	
Convention 139 concerning Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents	Ratified by Lebanon in 2000	

2.6 Environmental Health and Safety (EHS) Guidelines of the WB

2.6.1 Wastewater and Ambient Water Quality

Table 2-8 shows the EHS guidelines for treated sanitary sewage discharges into surface water bodies at 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. Note that the limits that will apply for Jezzine Caza are those of WBG EHS guidelines for treated sanitary sewage discharges since they are more stringent.

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

Pollutant	WBG EHS guidelines for treated sanitary sewage discharges	National discharge to surface water bodies MOE 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

Pollutant	WBG EHS guidelines for treated sanitary sewage discharges	National discharge to surface water bodies MOE Decision 8/1
TP	2 mg/L	10 mg/L
Oil and Grease	10 mg/L	30 mg/L
TSS	50 mg/L	200 mg/L
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 SO_2, NO_2, 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/M3)	NAAQS Maximum Levels (µG/M3)
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, institutional, and educational areas by the WHO are more stringent and therefore apply. Noise limits for residential, industrial and commercial areas are more stringent in the national standards and therefore apply.

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 Jezzine of the Governorate of South Lebanon. Jezzine is the smallest district of the South Lebanon Governorate (IDAL, 2017). The total number of the proposed roads to be rehabilitated under this project is two roads with a total length of 15,492 m. All of the roads are already existing and need rehabilitation works. The land acquisition did not occur during the design of any road under study. The length of each road along with the municipalities that it passes through is presented in the table below (Table 3-1).

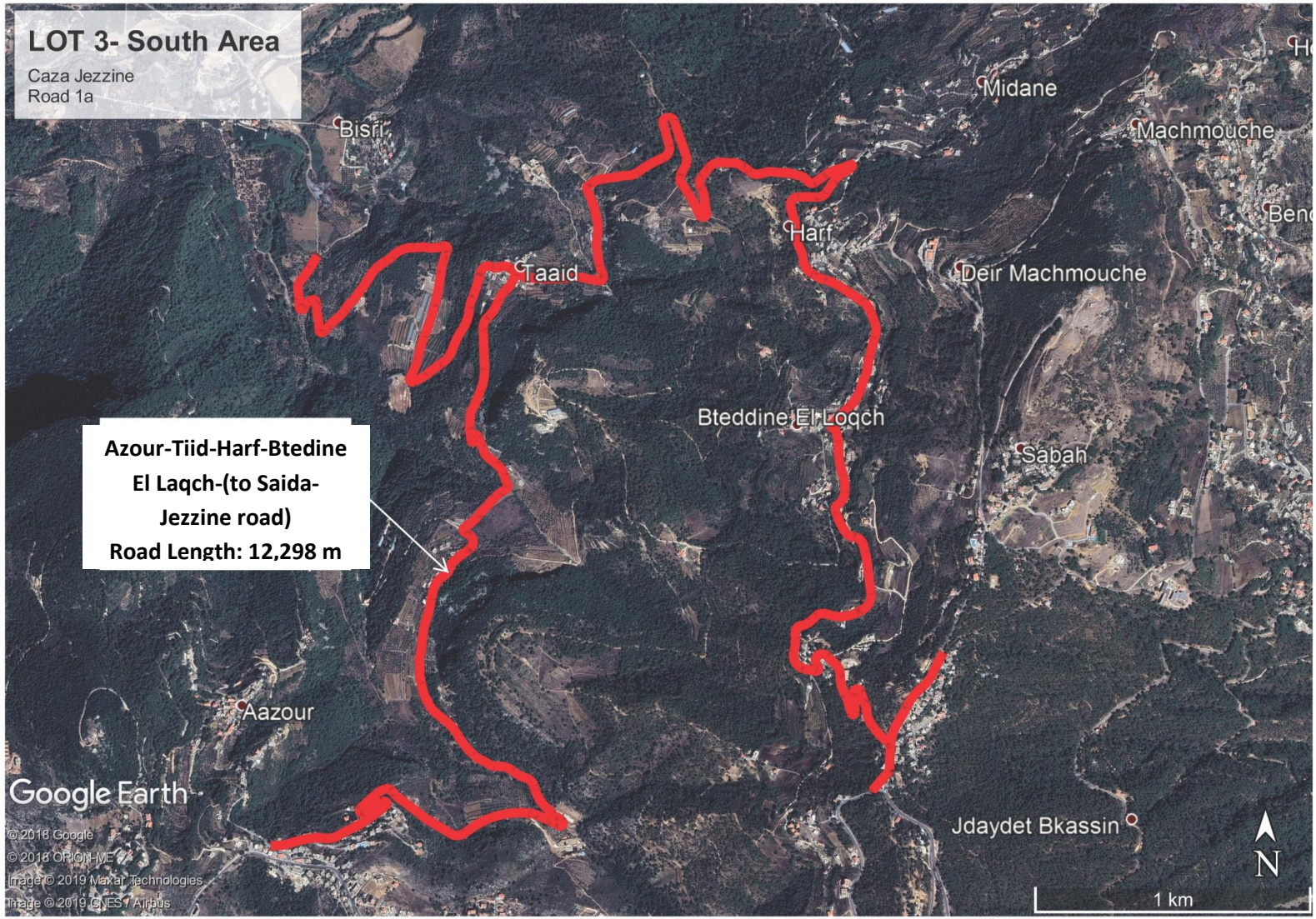
An overview of the proposed roads locations is presented in Figure 3-1and Figure 3-3, and their respective pavement condition plans are presented in Figure 3-2 and Figure 3-4.

Table 3-1: Proposed Roads within the Caza of Jezzine (Roads 1a and 1c)

	Road Code	Road Name	Alignment Name[1]	Classification	Municipalities	Length (m)	Average Width (m)
LOT 3A – Jezzine CAZA (L3-JE)	Road 1a	Azour-Tiid-Harf-Btedine El Laqch-(to Saida-Jezzine road)	L3-JE-RD01-a-1 L3-JE-RD01-a-2 L3-JE-RD01-a-3	Tertiary	Azour Tiid Harf Btedine El Laqch	6,070 5,624 604	4.2 5.9 7.2
	Road 1c	Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein	L3-JE-RD01-c	Tertiary	Jezzine Kfarhouna Ain Majdlein	3,194	5.7
					Total Length (m)	15,492	-

[1] The code for the roads represents the road label for example for L3–JE–RD01-a: L3=Lot No.3 (Lot Number as per Contract), JE=Jezzine (Name of Caza as per Contract), RD01-a=Road code (as per Contract)

Figure 3-1: Overview of Location of Road L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3 in Jezzine Caza



Source: Google Earth, 2019Figure 3-2: Pavement Condition Plan of Road L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3 in Jezzine Caza

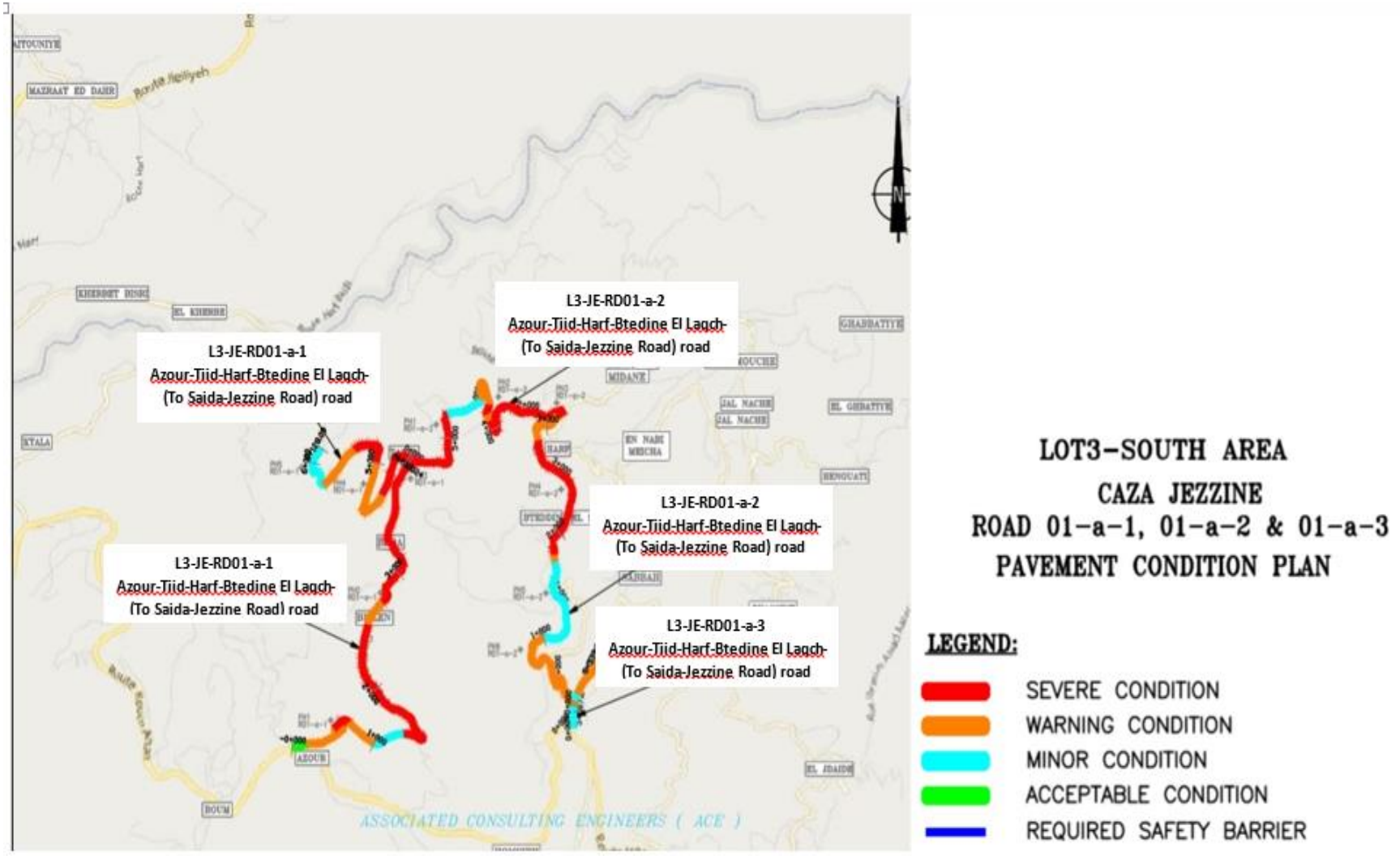
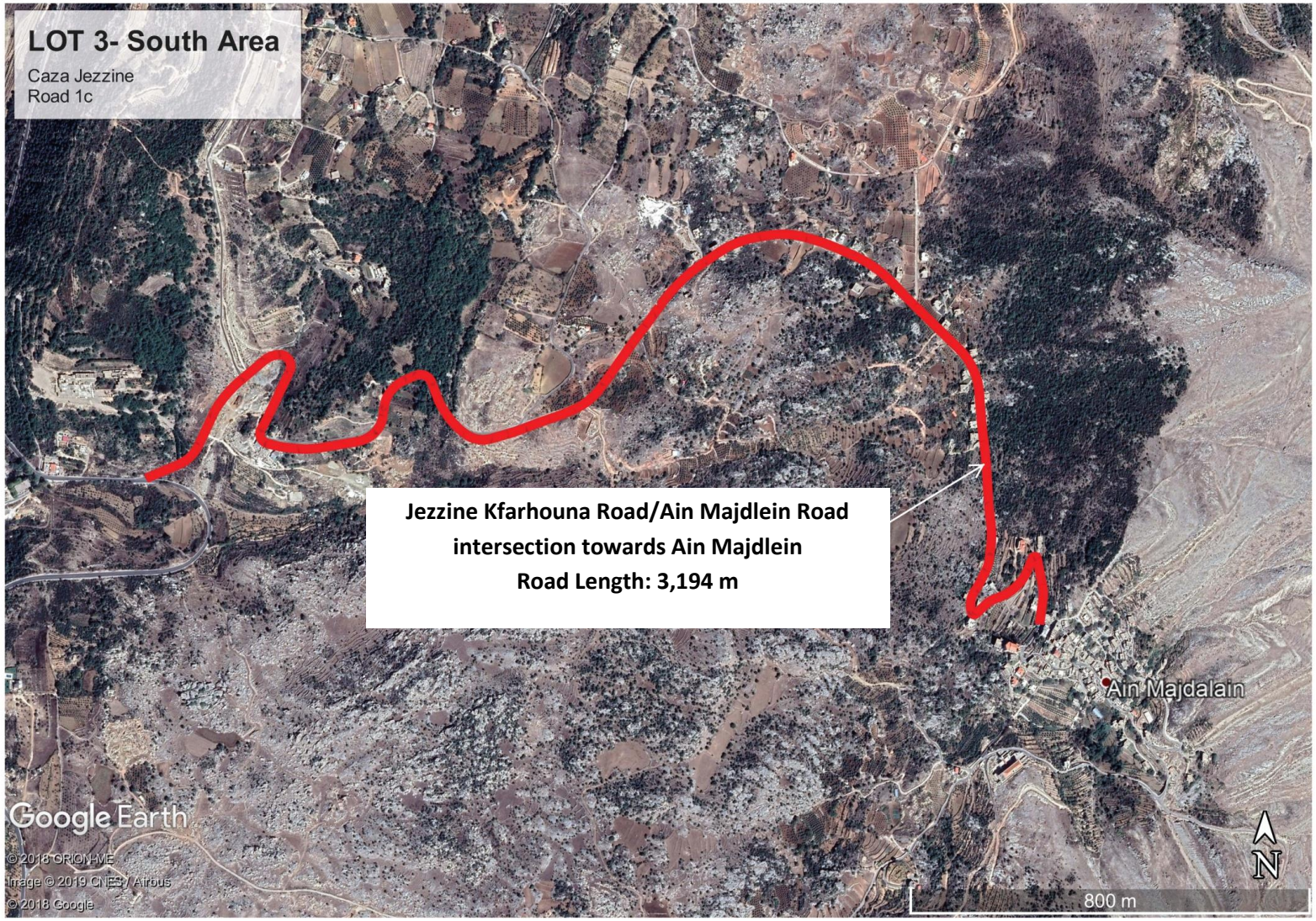
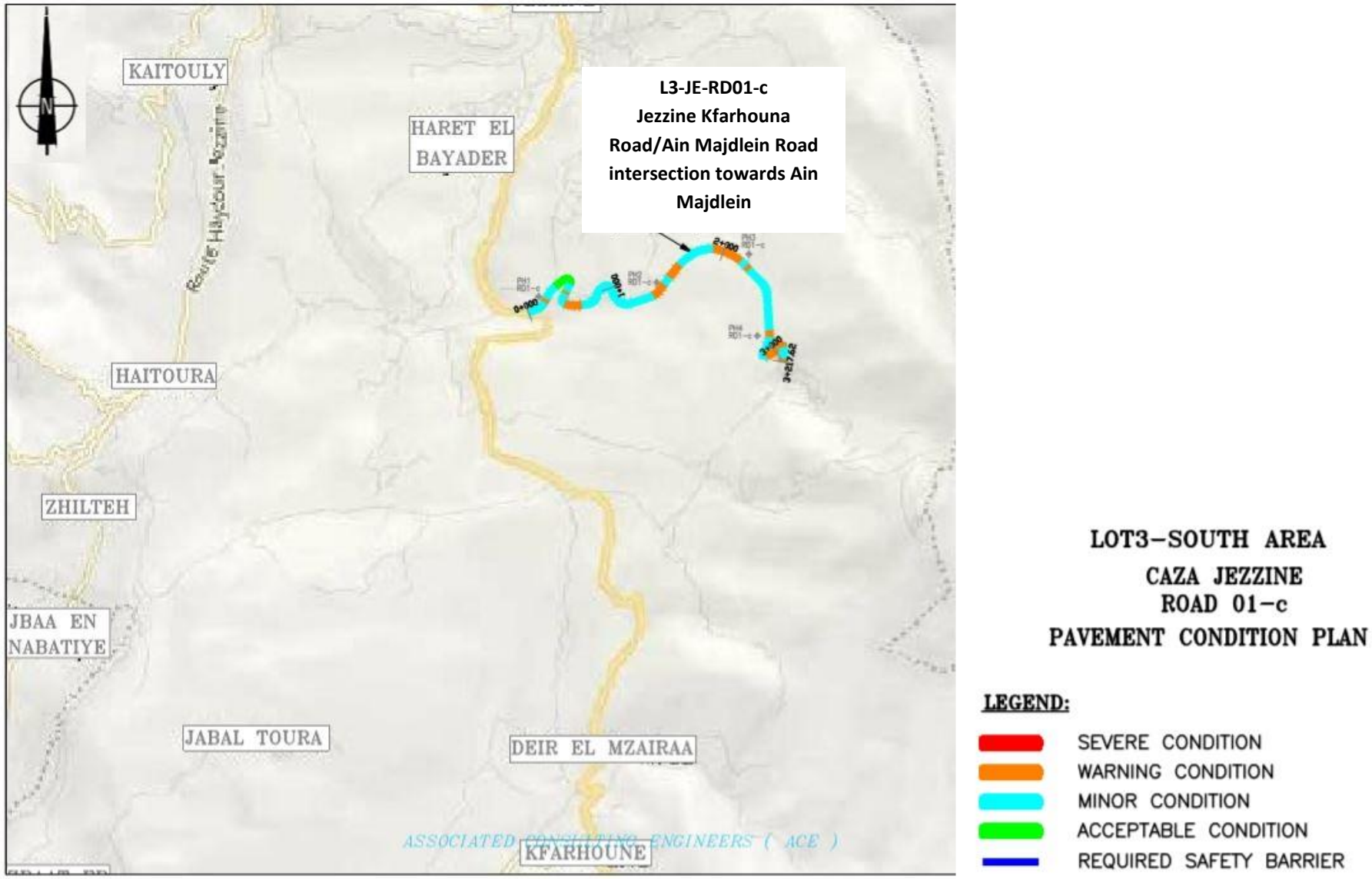


Figure 3-3: Overview of Location of Road L3-JE-RD01-c in Jezzine Caza



Source: Google Earth, 2019

Figure 3-4: Pavement Condition Plan of Road L3-JE-RD01-c in Jezzine Caza



Photos taken during the site visit can be found in Figure 3-5 till Figure 3-9.

Figure 3-5: Road L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3 (Azour-Tiid-Harf-Btedine El Laqch-(To Saida-Jezzine Road)

Source: AM, ACE - November, 2018

Figure 3-6: Road L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3 (Azour-Tiid-Harf-Btedine El Laqch-(To Saida-Jezzine Road)

Source: AM, ACE - November, 2018

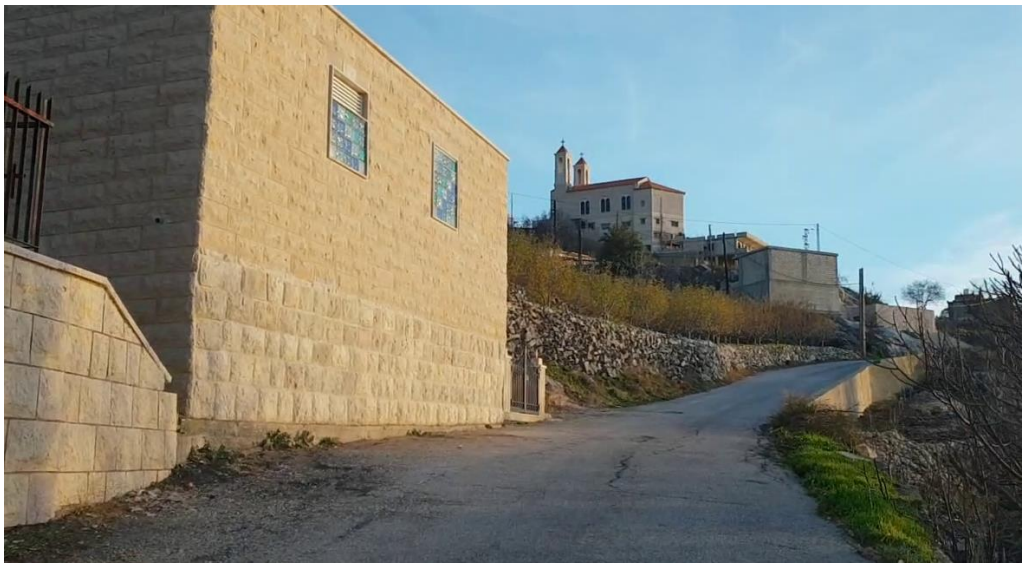
Figure 3-7: Road L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3 (Azour-Tiid-Harf-Btedine El Laqch-(To Saida-Jezzine Road)

Source: AM, ACE - November, 2018

Figure 3-8: Road L3-JE-RD01-c (Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein)

Source: AM, ACE - November, 2018

Figure 3-9: Road L3-JE-RD01-c (Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein)



Source: AM, ACE - November, 2018

3.2 Project Activities

The proposed project consists of the rehabilitation of existing roads in the Caza of Jezzine.

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	Road Code	Severe Conditions	Warning Conditions	Minor Conditions	Acceptable Conditions
Road 1a	L3-JE-RD01-a-1	56.30%	30.68%	11.06%	1.96%
	L3-JE-RD01-a-2	49.57%	31.36%	19.07%	0.00%
	L3-JE-RD01-a-3	0.00%	56.87%	43.13%	0.00%
Road 1c	L3-JE-RD01-c	0.00%	28.44%	66.78%	4.79%
Total		40.05%	31.44%	26.74%	1.78%

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, 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- Asphalting 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.

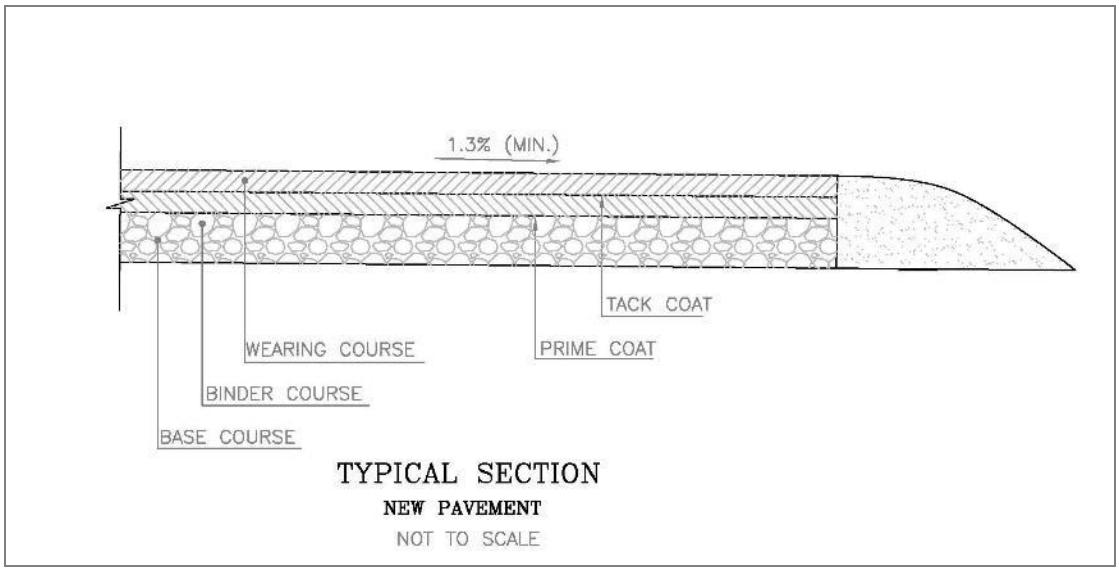
C- Phases of Construction for a stretch of road that needs: Pavement Total Reconstruction (Figure 3-10)

- 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 3-10: New Pavement Cross Section Scheme



The road sections in Jezzine Caza that require new pavement are as follows:

- From Station 1+000 to 6+128 of Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1).
- From Station 3+100 to 5+507 of Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-2).

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 activities, activities, roads will not be closed or shutdown. Works will be executed on the road right of way/passageway only and will not use or undermine any existing adjacent facilities. In addition, the rehabilitation activities will maintain a passing corridor within the alignment to grant access to nearby properties.

In case the works imply any temporary closure of the road, traffic will be secured by the project Contractor via alternative routes to reach relevant destinations. Detours and diversions were not included in the design. Therefore, before the execution of rehabilitation works, the Contractor, based on the schedule of works and if needed, will secure the access and traffic movement via other alternative routes and means in coordination with the related Municipality. Accordingly, all detours will be on existing alternative roads (public domain properties) and there is no need to use or rent some land to create the detour.

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. The depth of excavations for each proposed road is not more than 15cm in roads sections, and not more than 1.5m for walls and 3 to 4m for new culverts.

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 Used during the Rehabilitation Works

Materials	Quantity
Aggregates (fine and coarse)	5070 cu.m
Asphalt mix	5470 cu.m
Liquid Asphalt	14910 liters
Concrete mix	2819 cu.m
Water**	
Fuel**	
Thermoplastic Paint Material	8703 sq.m
Steel Guardrails	0

Materials	Quantity
Stones (for stone pitching)	4465 m
Reinforcing Steels	277 tons
Manhole Covers	67
Rubber Bitumen	1030 sq.m
Cat Eyes	1502
Delineators	176
Traffic Signals	388

**These items could not be estimated at this stage

Table 3-4: Equipment Used during the Rehabilitation Works

Equipment	Quantity
Steel-wheeled Rollers	2
Pneumatic-tyred Rollers	1
Asphalt Distributor	0
Concrete mixing trucks	2
Trucks	5
Excavators	1
Loaders	2
Asphalt Milling Machines	1
Steel Rollers	1
Motor Graders	1
Thermoplastic Road Marking Machines	1
Liquid Asphalt Spraying Tanks	1
Guardrail Post Driving Machines	0
Paver instead of Asphalt Distributors	1
Dumper Trucks instead of Trucks	5
Air Compressors	2
Asphalt Cutters	1

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 3-5 and Table 3-6 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 3-5, 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 3-5 and Table 3-6, 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 minimize labor influx and 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. Since priority will be given to people living in the region, labor influx is not expected. If labor influx is needed, it will be as minimized as possible. It is worth to mention that the workers will sign code of conduct before starting the work and training sessions will be conducted to inform the workers about their responsibility to act ethically. The duration of the project is 18 months with a one-year liability period

Table 3-5: 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 3-6: Numbers of the Machinery Drivers

#	ACTIVITIES	MACHINERY DRIVERS																
		Loader	Excavator	Motor Grader	Steel Roller	Milling Machine	Dump Truck	Water Tank Truck	Asphalt emulsion Sprayer	Asphalt Paver	Pneumatic Asphalt Roller	Mobile Crane	Guardrail Post Driving Machine	Concrete Mixer Truck	Mobile Concrete Pump	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 in order to prevent labor influx. Yet, if not all required labor skills area is available locally in the project region, then the Contractor will be obliged to hire laborers from other regions. This may generate a potential labor influx. This option should be kept to the minimum to the extent possible by the Contractor. 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 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, which is the Caza of Jezzine. 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 Jezzine is located in the Governorate of Bekaa and it is about 70 km away from the capital of Beirut (IDAL, 2020). The villages of the project area lie between 762 meters to 1,128 meters above sea level (a.s.l).

4.1.2 Geology

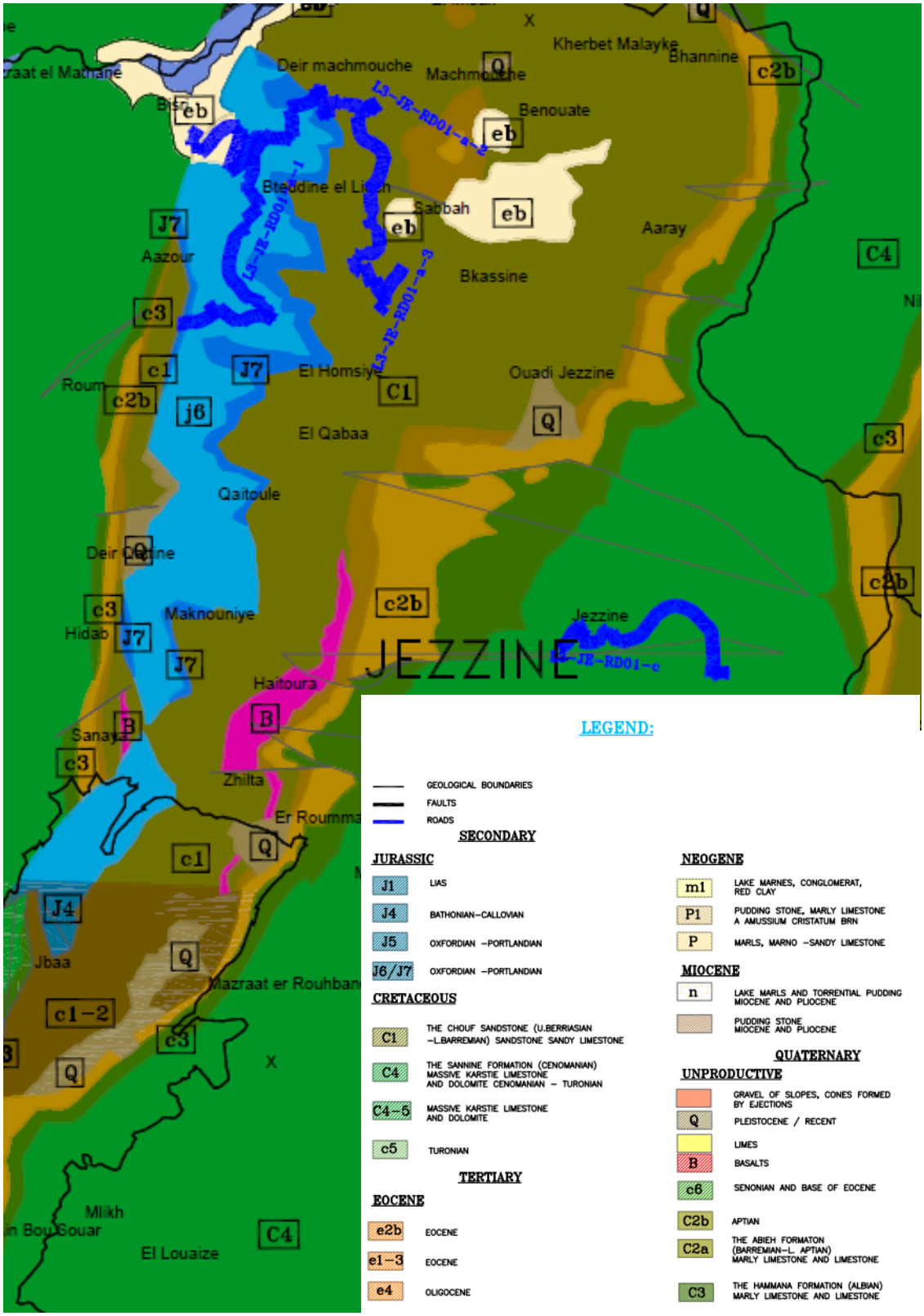
The geological formation of the proposed roads that are located within the Caza of Jezzine are presented in Figure 4-1. Based on the geological map below, the main geological formations within the study area are shown in the Table 4-1:

Table 4-1: Main geological formations within the study area

Road Code	Road Name		Geological Period	Formation	Description
Road 1a	Azour-Tiid-Harf-Btedine El Laqch-(to Saida-Jezzine road)	L3-JE-RD01-a-1	Cretaceous	Hammana Formation (C3)	It is a variable unit which can be most easily defined as the beds between the top of the Mdairej Limestone cliff and the base of the massive carbonates of the Sannine Formation. It is a varied sequence of generally thin bedded carbonates, marls and terrigenous sands that is generally brown in colour with a good marine bivalve fauna. The general trend is for carbonates to replace terrigenous clastics upwards and westwards. The entire Hammana Formation is around 140 m thick at the type section.
			Jurassic	Bikfaya Limestone (J6) Salima Limestone (J7)	It is a very variable sequence of brown-yellow ferruginous oolitic limestones, often burrowed and cross bedded, that alternate with brown marls. The unit is mainly fairly thin bedded (although some massive units occur, especially at the top) and a relatively recessive topography occurs. Thickness varies from zero-few meters to 150 m.
			Eocene	Eocene (eb)	This rock formation is widespread in South Lebanon. It is composed of marly and chalky limestone with a thickness in the range of 4500 m–550 m. With a thick succession, it has a good potential to store groundwater.
		L3-JE-RD01-a-2	Cretaceous	Chouf Sandstone (C1)	It is an often ferruginous brown to white sandstone with associated clays, shales and lignites. Some of the darker layers contain woody or coaly fragments, often with pyrite, marcasite and amber. Locally, the Chouf Sandstone contains basaltic volcanics and reddish clayey beds which appear to be weathered volcanic tuffs. The Chouf Sandstone is very variable in thickness, ranging from a few metres to 300 m thick and in places showing rapid lateral changes.
			Jurassic	Bikfaya Limestone (J6)	It is a very variable sequence of brown-yellow ferruginous oolitic limestones, often burrowed and cross bedded, that alternate with brown marls. The unit is

				Salima Limestone (J7)	mainly fairly thin bedded (although some massive units occur, especially at the top) and a relatively recessive topography occurs. Thickness varies from zero-few meters to 150 m.
		L3-JE-RD01-a-3	Cretaceous	Chouf Sandstone (C1)	It is an often ferruginous brown to white sandstone with associated clays, shales and lignites. Some of the darker layers contain woody or coaly fragments, often with pyrite, marcasite and amber. Locally, the Chouf Sandstone contains basaltic volcanics and reddish clayey beds which appear to be weathered volcanic tuffs. The Chouf Sandstone is very variable in thickness, ranging from a few metres to 300 m thick and in places showing rapid lateral changes.
Road 1c	Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein		Cretaceous	Sannine Limestone of Cenemonain (C4)	This unit is divided into three subunits namely: - Dolomitic Limestone (C4a): 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 (C4b): 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 (C4c): The Limestone of this unit is highly karstifie. The color of this formation is white to brown and its thickness is about 300 meter.

Figure 4-1 Geology Map of the Study Area



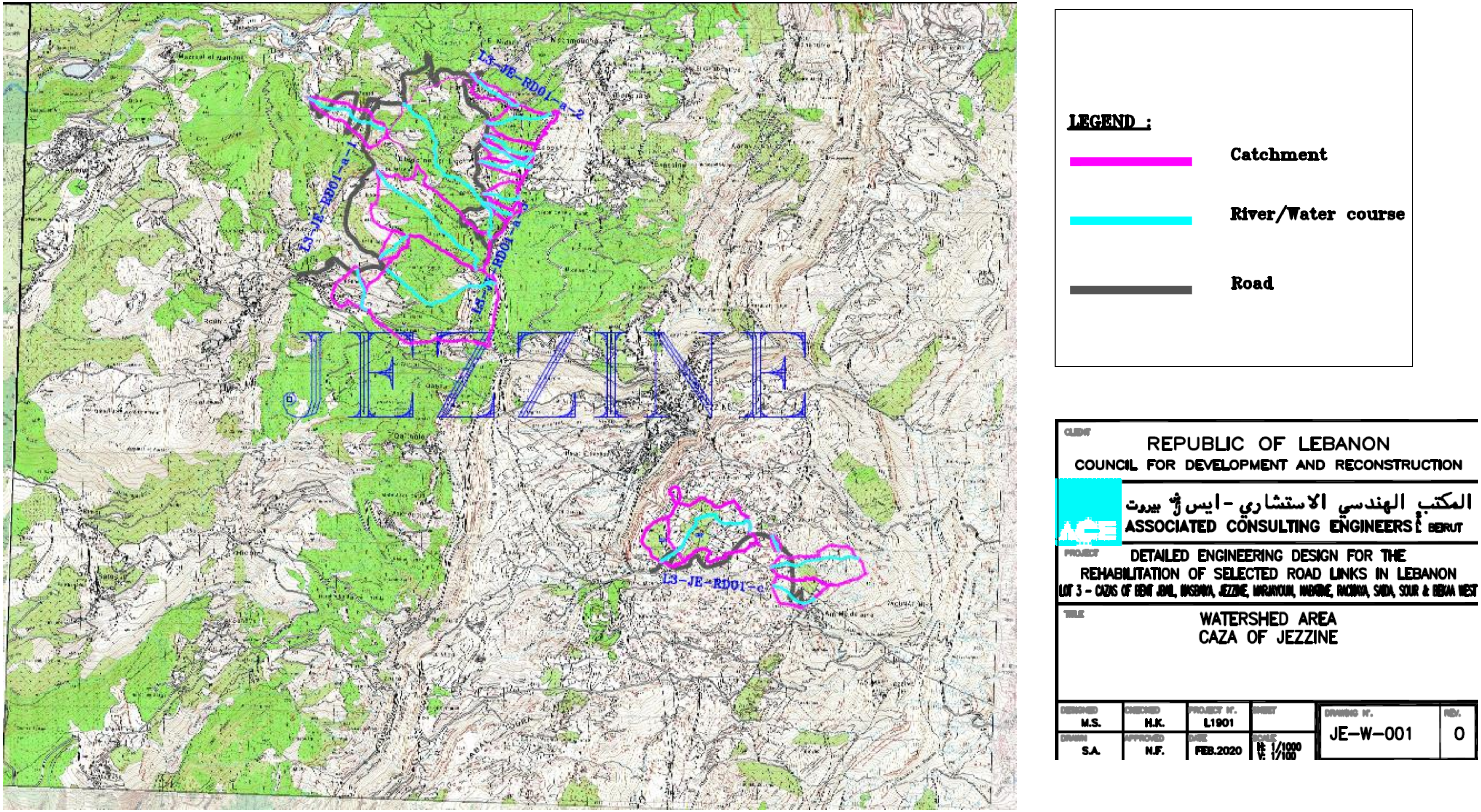
Source: Prepared by ACE based on the geological map of Dubertret scale s1/50000

4.1.3 Hydrogeology

The district also hosts abundant water resources, including the Nahr El Awali that passes through the Jezzine Caza, yet it is 1 km away from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3), while it is 1.3 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. In addition, the Jezzine village hosts the famous Jezzine waterfall which is 1.5 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

As for the proposed roads, the hydrological map shows that there are several streams in the areas surrounding the project roads (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and (L3-JE-RD01-c). The distance between the proposed roads to the various streams differ between around 1 km to more than a few km. Figure 4-2 represents the hydrological maps of the proposed roads, including all the streams along the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

Figure 4-2 Major Rivers in Jezzine District and Location of Existing Project Road (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3 and L3-JE-RD01-c)

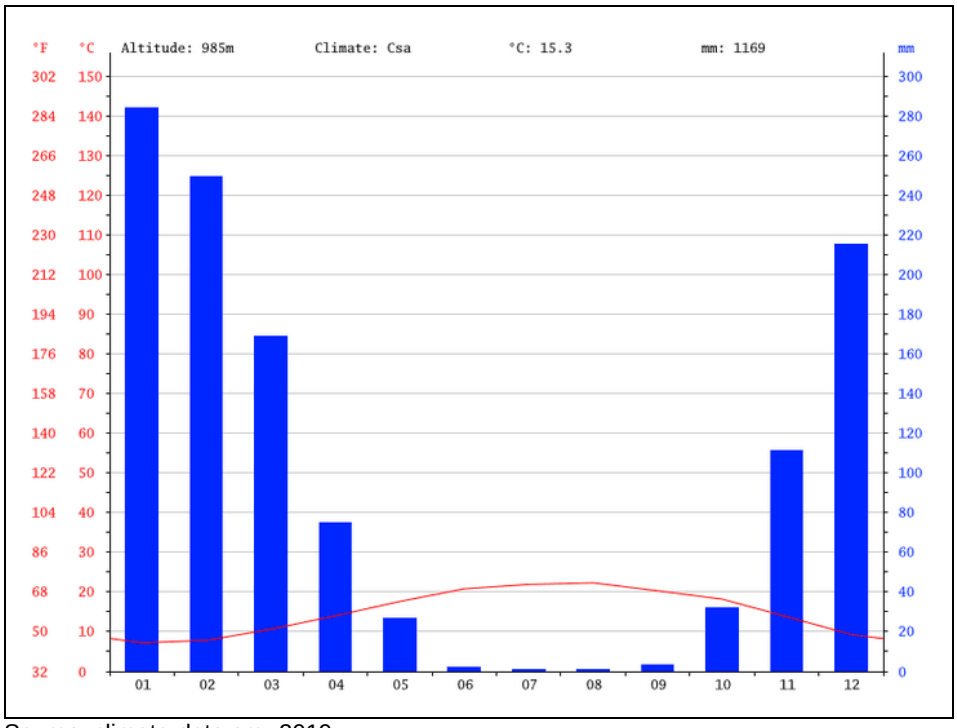

L3-JE-RD01-a-2
L3-JE-RD01-a-1
L3-JE-RD01-a-3
JEZZINE
L3-JE-RD01-c
LEGEND :
Catchment
River/Water course
Road
CLIENT
REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION
المكتب الهندسي الاستشاري - ايس بيروت
ASSOCIATED CONSULTING ENGINEERS BEIRUT
PROJECT
DETAILED ENGINEERING DESIGN FOR THE
REHABILITATION OF SELECTED ROAD LINKS IN LEBANON
TITLE
WATERSHED AREA
CAZA OF JEZZINE
M.S.
H.K.
PROJECT N°.
L1901
S.A.
N.F.
FEB.2020
DRAWING N°.
JE-W-001
REV.
0

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

4.1.4 Climate and Meteorology

The village of Jezzine is located in the Caza of Jezzine, specifically at a distance of 1.5 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. The average annual temperature in the village is 15.3 °C. The month of August is the warmest month with an average temperature of 22.3 °C, however, the average temperature occurring in the coldest month that is January is 7.2 °C. The driest month is July with 1 mm of precipitation. Most of the precipitation here falls in January, averaging 284 mm. However, the average annual precipitation is 1169 mm (climate-data.org, 2020). The Climograph of Jezzine village is represented in Figure 4-3.

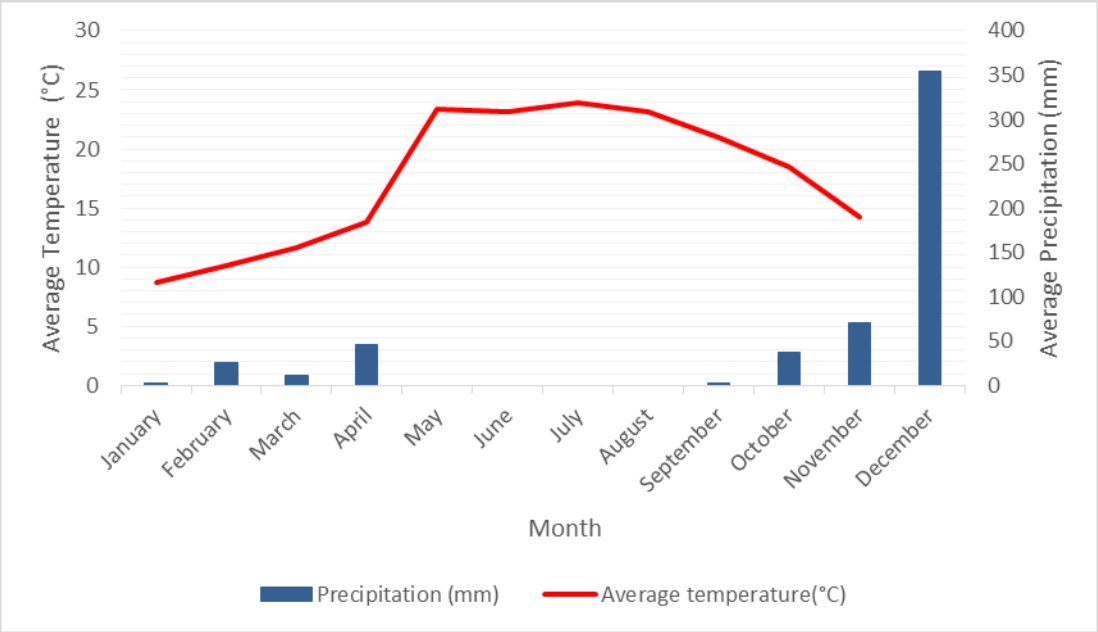
Figure 4-3: Climograph of Jezzine at 985 m (Historical Data between 1982-2012)



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 Machghara located at the altitude 1032 meters and at around 5.3 Km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. This data represents the average temperatures and average precipitation of the year 2019 (Figure 4-4).

Figure 4-4: Climograph of Machghara at 1,032 m from LARI Station for the Year 2019



Source: LARI, 2019

As for the wind data, wind speed and direction data were also obtained from LARI's station in New Nabatiye which was the nearest station to the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) at around 20 km away. The station in New Nabatiye is at an elevation of 498 m, while the elevation of the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) specifically at the part (L3-JE-RD01-a-1) is around 520 m (Tiid). Yet, this station for the wind data was taken into consideration since it was the closest station to the proposed roads in Jezzine and had an approximately similar elevation. Table 4-2represents the average monthly and annual wind speed and direction for the year of 2017.

Table 4-2: Monthly and Yearly Averages of Wind Speed (m/s) and Direction (degrees) registered by New Nabatiye LARI Station in 2013

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Average per year 2017
Monthly Average Wind Speed (m/s)	0.05	0.055	0.18	0.16	0.08	0.09	0.1	0.14	0.15	0.14	0.04	0.12	0.109
Monthly Average Wind Direction (Degrees)	166.8	151.78	181.87	183.1	203.3	218.43	231.48	226.16	201.86	193.81	163.93	150.54	189.42

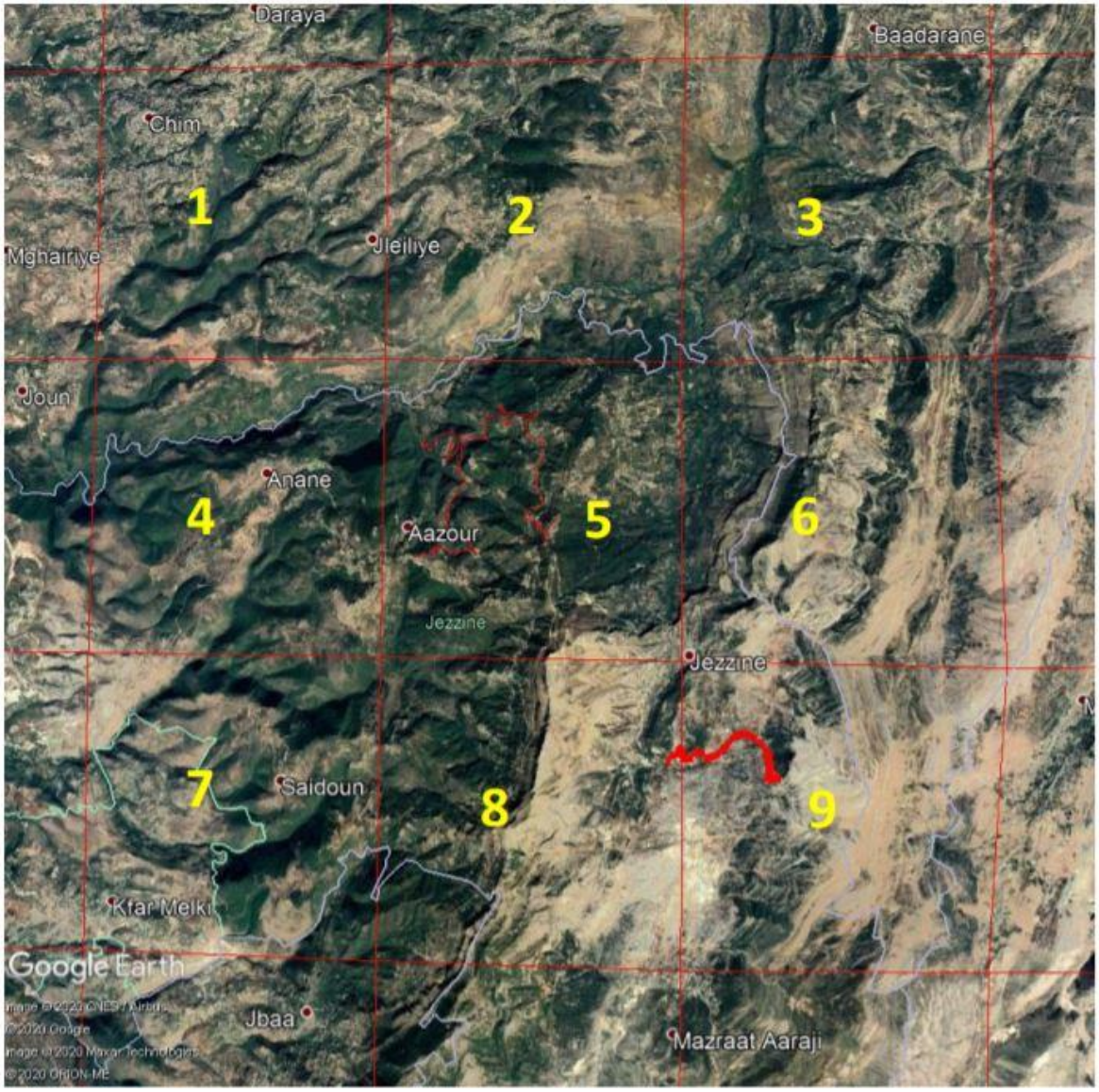
Source: Data provided by LARI on January 21, 2020

4.1.5 Air Quality and Noise

Ambient air quality of the project area was requested from MOE. Data was available from the UNDP project "Environmental Resources monitoring in Lebanon" which is based at the Ministry of Environment for the year 2010. The available data is for criteria pollutants: Particulate Matter (PM), Ozone (O_3), Carbon monoxide (CO), Nitrogen dioxide (NO_2), Sulfur dioxide (SO_2). The project area was divided into different cells (Figure 4-5) and the data of the annual background average concentrations in $\mu g/m^3$ was obtained. Table 4-3 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 4-5: The Project Area Divided into Different Cells



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

Table 4-3: Annual Ambient Air Quality at the Project Site for the Year of 2010 (The Roads are Located on Cells 5, 8 and 9)

Pollutant (µg.m-3)	NO2	O3	PM10	PM2.5	SO2	CO
Concentration in Cell 5	13.78	88.79	18.93	16.34	10.93	318.12
Concentration in Cell 8	15.15	86.59	18.90	16.40	11.06	316.06
Concentration in Cell 9	9.70	88.67	17.20	15.00	8.49	263.09
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 NO_2 in all the cells comply with the national standards and the WHO Guidelines. As for the concentrations of PM_{10}, the obtained values were in

compliance with the national standards and WHO Guidelines while $PM_{2.5}$ in all the cells were not in compliance with the WHO standards for air quality.

The noise levels in the Jezzine Caza were measured by the team. The first site has been chosen along the road Btedine El Laqch to Azour (L3-JE-RD01-a-2), and the second site has been chosen in the village of Ain Majdleine through which the road (L3-JE-RD01-c) passes. The measurements were taken during day time in March 2020. The team made sure to take different measurements, such as one near a residential area and another site near a calm area. Generally, the road at Site 1 was near a residential area through villages, while Site 2 was near a calm area. The noise was measured during a period of 3 minutes. Table 4-4 below shows the results of the noise measurements. From the results it is shown that the equivalent continuous sound level (Leq) at Site 1 and Site 2 were 48 dB and 49 dB respectively as the value of both Site 1 and Site 2 are within the national standards for noise limits in residential areas (45-55 dB).

Table 4-4: Noise Levels Measurements at Site 1 and Site 2 in Jezzine Caza

Location	Noise Level in Decibels (dB)		
	Minimum	Average	Maximum
Site 1 (Residential site): Btedine El Laqch to Azour	27.6	49	81.1
Site 2 (Calm site): Ain Majdleine	26.5	48	83.7

4.1.6 Land Use/Land Cover

In Jezzine Caza, agricultural activities are seen in different villages as the Caza is characterized with different types of soil and arable lands. The Caza has a variation of elevations, mild climate conditions and different type of soils makes it a distinctive region (IDAL, 2017). All these render the agricultural sector as a primary source of economic activity for the inhabitants. The Caza hosts different agricultural activities and produces a variety of agricultural products such as fruits (apples, grapes, pears, citrus), vegetables, olives, grapes, pine and organic farming. (IDAL, 2017). The project team has conducted site visits to all the project roads in the Caza of Jezzine in order to collect information about the environmental features along the roads.

Some of the roads passes through urbanized villages within Jezzine caza and others are surrounded with agricultural lands as shown in the table below (Table 4-5).

Table 4-5: Visual Classification of Land Use based on Google Maps

Municipality	Land Use
Azour	Moderately populated with dense trees and vegetation and some agriculture areas
Tiid	Lightly populated with dense trees and vegetation and some agricultural areas
Harf	Scattered houses with dense trees and vegetation and some agricultural areas
Btedine El Laqch	Moderately populated with dense trees and vegetation
Ain Majdlein	Presence of scattered houses with trees, vegetation and some agricultural areas

Source: Google Maps, 2020

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

4.2 Biological Environment

4.2.1 Flora

Jezzine has been known for its pine trees and its agricultural sector (UNDP, 2018). Most of the Jezzine Caza is covered in natural areas. Its location with a variation of elevations, mild climate conditions and different type of soils makes it a distinctive region (IDAL, 2017).

Stone pine Pinus pinea forests extend on altitudes ranging between sea level and 1500m in several regions including on the sandy soil of Jezzine region (FAO, 2016; SOER, 2010). The area covered by these forests has decreased primarily as a result of war, forest fires, and urban development (UNDP/CEDRO, 2012). The number of processors/traders of pine nuts is estimated to be 5 in the Jezzine area. (FAO, 2016). The Caza also has important vine yards, vegetable fields and fruit orchards.

Within the Jezzine Caza, Jabal el Rihane is named as a UNESCO Biosphere Reserve (SOER, 2010), and the Bkassine Pine Forest is listed as a protected forest and hima (SOER, 2010) *See more details in Section 4.2.3*

During the site visits, different kind of trees and areas were observed such as the natural terrains with high and low vegetation along the roads, in addition to agriculture areas and planted trees. Various types of trees and cultivated areas can be found within the project area. These are as follows:

- Pine trees, Olive trees, Eucalyptus trees, Cypress trees and Oak trees and fruit trees along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3).
- Pine trees, Cypress trees and Oak trees and fruit trees along the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

During the site visits, there was no floral and tree species of an ecological importance observed along the roads of the project area. Trees identified along both proposed roads, are shown in the Figure 4-6 below.

Figure 4-6: Road L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3 (Azour-Tiid-Harf-Btedine El Laqch-(To Saida-Jezzine Road)

Source: AM, ACE - November, 2018

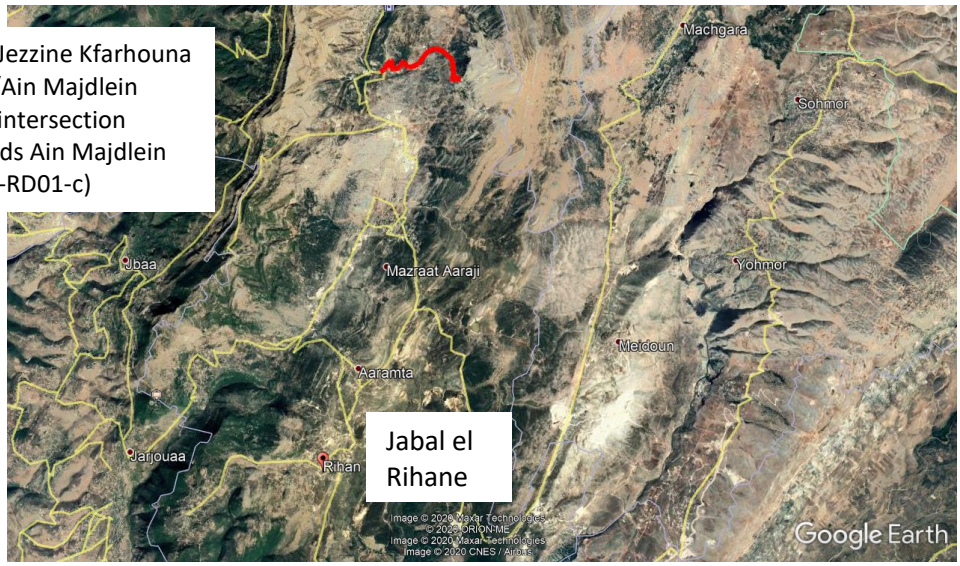
4.2.2 Fauna

Land in the Jezzine Caza is also used for significant farming activities and livestock production. The Caza is known for its cattle raising, poultry farming and beekeeping activities. As such its hosts around 430 dairy cows, 8,650 goats, 90 poultry farmers and 3,000 beehives (IDAL, 2017). During the site visits, wild animals including mammals and birds were not encountered. Although grazing is a very common practice especially in the Ain Majdlein area, the presence of grazing livestock was not noticed along the project roads. This can be explained by the fact that the site visits were done during winter month of February.

4.2.3 Ecologically Sensitive Areas

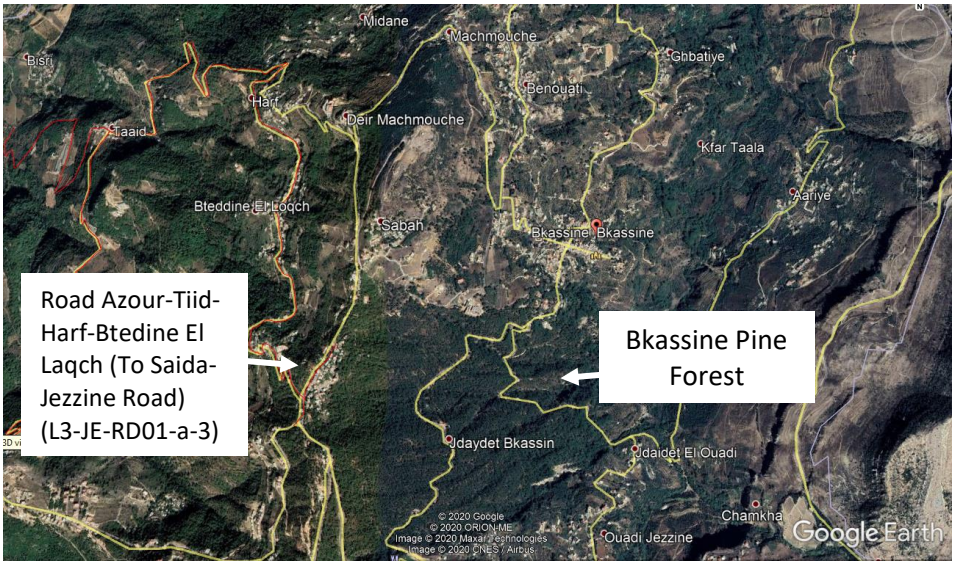
The Caza of Jezzine is home for remarkable natural sites and caves providing opportunities for ecotourism and summer activities for many visitors. The Caza also hosts Jabal el Rihane which is named as a UNESCO Biosphere Reserve (SOER, 2010), in addition to the 200 Ha Bkassine Pine Forest is listed as a protected forest and Hima (SOER, 2010). Yet, the Jabal el Rihane Reserve is at a distance of 9.4 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. On the other hand, the Bkassine Pine Forest is at a distance of 1.3 km away from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-3) (Figure 4-7 and Figure 4-8).

Figure 4-7: Location of Jabal El Rihane in reference to the nearest proposed road Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein (L3-JE-RD01-c)



Source: Google Maps, 2020

Figure 4-8: Location of Jabal El Rihane in reference to the nearest proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-3)



Source: Google Maps, 2020

The district also hosts abundant water resources, including the Nahr El Awali passes through the Jezzine Caza, yet it is 1 km away from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3), while it is 1.3 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. In addition, the Jezzine village hosts the famous Jezzine waterfall which is 1.5 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. Yet, none of these ecologically sensitive areas were observed during the site visits to the proposed road projects.

Moreover, the closest Important Bird Area (IBA) to the proposed roads is found in the Marjayoun Caza which is around 19 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein (BirdLife International, 2020).

4.3 Socio Economic Environment

4.3.1 Demographic Profile

The Caza of Jezzine, the smallest district of the South Lebanon Governorate (IDAL, 2017), has a population of 25,126 inhabitants, 3,050 and 1,812 of which are registered Syrian Refugees and Palestinian refugees respectively (OCHA, 2016). However, the caza doesn't host any Palestinian refugee camp. Concerning vulnerable groups, the number of poor[9] Lebanese in Jezzine is 9,125 (OCHA, 2016). There is no available information on other groups, such as female headed households and people with disabilities. As for the elderly (seniors above the age of 65), they comprise 18% of the total population in the caza compared with the country's national average of 11% (CAS, 2019). The average household size in the caza is 3.3, the lowest among all the districts, compared to the average household size in Lebanon of 3.8 individuals (CAS, 2018-2019). The Caza also hosts the largest share of senior persons, 18% compared with the national average of 11% (CAS, 2018-2019). Moreover, the unemployment rate in Jezzine Caza is estimated at 8.3%, less than the national average 11.4% (CAS, 2018-2019).. According to the UNHCR, the South Governorate hosts 130 informal tented settlements for Syrian Refugees none of which are present in Jezzine caza (OCHA, 2016). The number of Syrian Refugees within the he main villages through which the proposed roads pass through is 593 as shown in Table 4-6(UNHCR, 2019). It is worth to mention that there are no refugee camps in the area, as the Syrian refugees in the caza are integrated into the community.

Table 4-6: Number of Syrian Refugees in the villages through which the proposed roads pass

Village	Number of Syrian Refugees
Azour	48
Tiid	9
Harf	8
Btedine El Laqch	19
Jezzine-Ain Majdlein	509

4.3.2 Economic Activities and Infrastructure

Most of the Jezzine Caza is covered by natural areas. Its location with a variation of elevations, mild climate conditions and different type of soils makes it a distinctive region (IDAL, 2017). In addition, the Caza has 3 rivers spanning its territory and this renders the agricultural sector as a primary source of economic activity for the inhabitants. The Caza hosts different agricultural activities and produces a variety of agricultural products (IDAL, 2017). Out of the three major slaughterhouses located in the South Lebanon Governorate, one is located in the Caza of Jezzine (UNDP/CEDRO, 2012). The main agricultural activities and products are shown in Table 4-7 and Table 4-8.

[9] Poor is referred to people who are living in bad conditions variously described as marginalised, vulnerable, excluded or deprived. People are in poverty when they are deprived of the basic life conditions such as income, diets, material goods, amenities, standards and services (UNDP, 2006)

Table 4-7: Main agricultural activities and products in the Jezzine Caza

Region	Products
Coastal Regions	Citrus Loquat Vegetables Olives Organic farming
Central Regions	Olives Grapes Vegetables Some pine forests Organic farming
Higher Regions	Pine forests Fruit produce (mainly apples, grapes, pears)

Table 4-8: Main farming activities and products in the Jezzine Caza

Activity	Products
Cattle Raising	45 farmers 430 dairy cows 8,650 goats
Poultry Farming	90 poultry famers
Beekeeping	150 beekeepers 3,000 beehives

However, during the war, out of the total 18,000 beehives completely destroyed, 450 of them were located in Jezzine (FAO, 2006).

Moreover, Jezzine is the only southern region of the country with a quality of soil that allowed for the flourishment of the wine industry in the region. There is only 1 winery operating in Jezzine, even though wineries from other regions are planting vineyards in the region (IDAL, 2020).

Jezzine has been known for and greatly relies on its handicrafts (soap making, knife design, sweets, and others) and restaurants as an important source of business. Given its location and weather, several agricultural businesses started to cater to local needs (UNDP, 2018). In Jezzine, several sectors are at the core of development plans: ecotourism, agribusiness, and public-private partnerships are being encouraged. For instance, UNDP supported the establishment of an agroprocessing factory in Jezzine (UNDP, 2018). Individual activities are mostly concentrated in non-mineral and metal subsectors. Stones, marbles and cutlery are commonly produced have resulted in the development of a handicraft industry (IDAL, 2017). A significant number of the labor force in the Caza is engaged in the food and beverage industry. The village of Jezzine is the center of the industrial activities of the district, hosting around 40% of the industrial companies and around 40% of the total industrial workforce. Moreover, a large number of the products manufactured in Jezzine are exported to Europe and Africa, while the majority of these manufacturing companies rely on raw material import from Europe (IDAL, 2017).

During the site visits in December 2018, different observations were recorded along both proposed roads, such as small facilities and shops in different fields, and car maintenance shop mainly along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3). These shops are located at an approximate distance of three to four meters from the side of the road. In fact, there is a car parking space that separates these stations from the main

road alignment. There were also residential buildings and villas. More details of these main economic activities can be found in Table 4-9.

Table 4-9: Main Socio-Economic Activities along the proposed roads

Road	Socio-Economic (Shops, Residential areas, traffic, …)
L3-JE-RD-01-a (Azour - Tiid - Harf - Btedine el Laqch - (to Saida - Jezzine road)	S0: building under construction, few residential buildings S300: Some residential buildings on the left S2500: residential buildings on the left S2680: Church on the left, greenhouses S2700: few residential buildings S4000: Church on left, few residential buildings S5600: facility on the left Towards Tiid S620: Few residential buildings Towards Harf S2700: Villa on the right Btedine El laqch S3450: Residential on the left S4700: Few residential buildings S5100: municipal sport stadium Mafraq Btedine El Laqch – Tiid S325: few residential buildings S500: few residential buildings S1350: Church and cemetery S1700: residential area S1900: Municipality on left S1900: Church S2100: Residential area S2400-S2500: Few residential buildings S2650: Villa on left S5650: Church on the left Towards Sabbah S0: Barber shop (right) S370: Car maintenance shop, residential buildings S575: villa on left S900: restaurant on left Roum Public school and Jezzine Public Primary School which are located at 1km and 1.8 km from this road
L3-JE-RD-01-c (Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein)	S300: excavation activities and machinery on right S650: Residential villa S1800: Few residential buildings S2000: Few residential buildings S2200: Residential buildings S2400: Residential buildings, waste bins S2725: cemetery S3100: residential area S3200: Church on right Farid Serhal Musuem at 200 m away from this road Ain Majdlein public school located at around 80m from this road and at 200 m south the church (S3200)

During the site visit electricity lines and streetlights were observed along some of the proposed roads. The area also has water supply networks and wastewater collection networks. In fact, according to the CDR progress reports a project for the rehabilitation of drinking water supply system was implemented in Jezzine. In addition, a project for the installation of sewer networks in Jezzine was expected to be completed in December 2017. However, no updated data is available regarding the status of this project (CDR, 2017 and CDR, 2018).

4.3.3 Education Services

Jezzine Caza has 11 public schools, five out of which are located in Jezzine village. The caza maintains a high literacy rate (98%) which is more than the national literacy rate which is 94%. There are two vocational schools in Jezzine, Jezzine Ecole Agricole technique and Maria Aziz Vocational College, yet students usually attend one of Saida's 8 universities (IDAL, 2017).

As per the Google Maps, the Roum Public school is located at a distance of 1 km from the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3). Also, the Jezzine Public Primary School which is located 1.8 km away from the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3). The village Ain Majdlein, through which passes the proposed L3-JE-RD01-c road of Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein, hosts the Ain Majdlein public school that is located at around 80 m from the project's proposed road and at 200 m south the church in Ain Majdlein. However, during the site visits, no educational institutions were observed directly along either of the proposed roads. Yet, the proposed roads might be used to reach other educational establishments in the area.

4.3.4 Health Services

Within the Caza of Jezzine, the Jezzine village hosts the Jezzine Governmental Hospital which is located in the area lying in between the 2 proposed roads. The hospital is at a distance of 1.2 km from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein and at a distance of 3 km from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3). Yet, the proposed roads might be used to reach to health centers within the area

4.3.5 Cultural Heritage

Jezzine has been known for its tourist and religious attractions (UNDP, 2018). According to the Ministry of Tourism (2011), the Jezzine village hosts many cultural sites, including:

- Mar Maroun Church;
- Saydet Al Nabi Church;
- Evangelical Church;
- Mar Antonios Church;
- Saint Coeurs Convent;
- Sports Stadium;
- Public Library.

Moreover, according to the Ministry of Tourism (2011), the Aazour village hosts many cultural sites, including Al-Jamif Citadel and The Old Olive Press while Btedine El Laqch village hosts many cultural sites, including Sacrophagi carved in Rocks and the Ruins of an Old Mill.

As per the Google Maps, there are several churches located in the heart of the Jezzine village are at a distance 1.7 to 2 km away from the proposed road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. However, in the Btedine El Laqch village, there is the Saint Joseph Church which is located at only 0.05 km away from the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3).

During the site visits in December 2018, six churches were detected by the team along the roads as shown in Figure 4-9 and Figure 4-10 below:

- One church at Sta. 2+680 and one church at Sta. 4+000 (Figure 4-9) along the along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1).
- One church at Sta. 1+350, one church at Sta. 1+900, and one church at Sta. 5+650 along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-2).

One church at Sta. 3+200 along the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein (Figure 4-10).

Moreover, the proposed roads might be used to reach to the other sites such as Farid Serhal museum (which is 200m away from road Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein (L3-JE-RD01-c).

Figure 4-9: Church along Road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1).

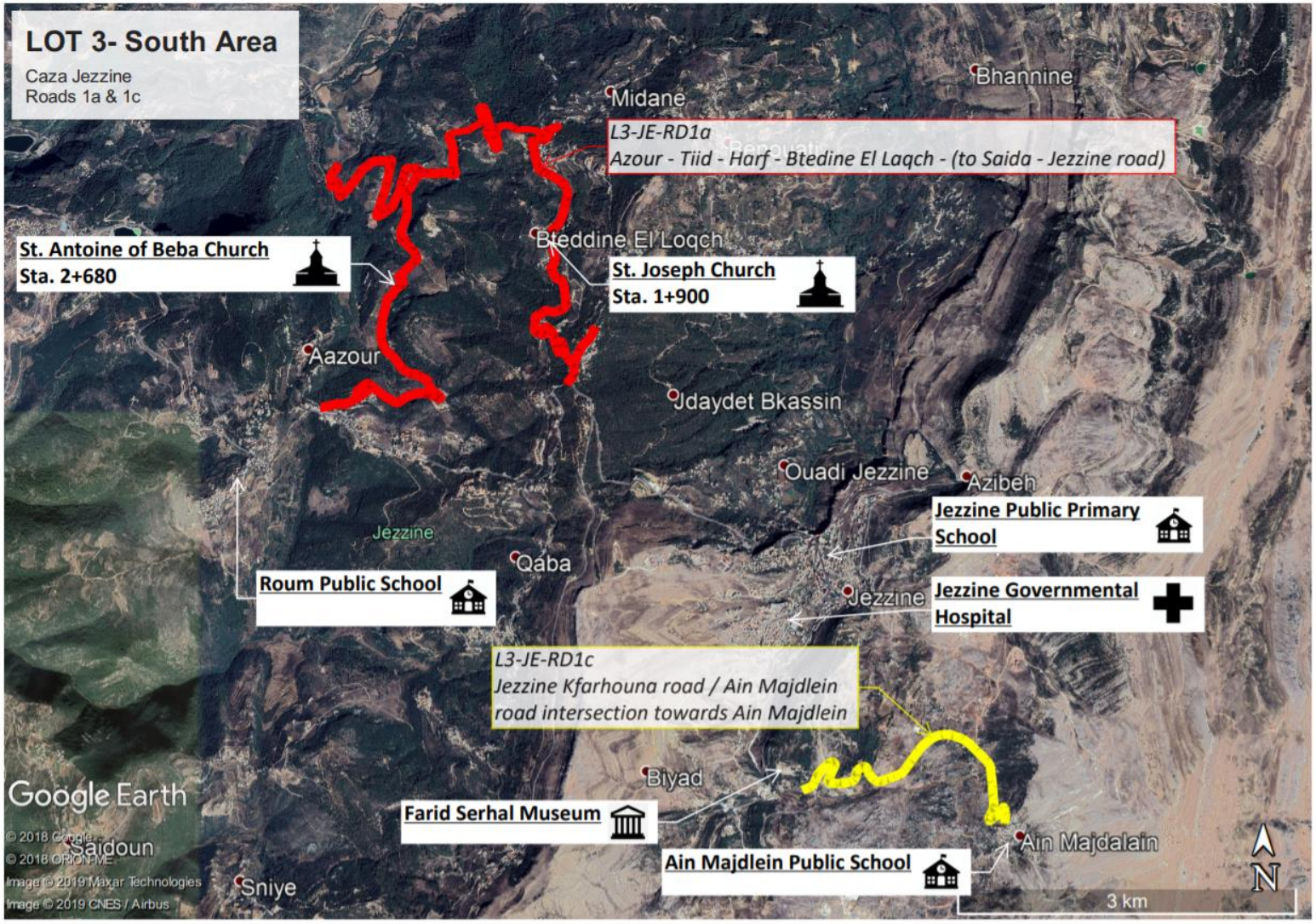
Figure 4-10: Church along Road Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein (L3-JE-RD01-c)

4.3.6 Road sensitive receptors

Categories considered as sensitive receptors during road rehabilitation are schools, churches, hospitals, mosques, closest residential buildings and commercial shops, and other archeological features.

As per Google Maps (see Figure 4-11) and Annex 1, six churches were detected by the team along the roads: Two along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1), three along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-2) and one church along the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. The Museum of Farid Serhal is located at around 200 m from road L3-JE-RD01-c. In addition, neither educational institutions nor health centers were in close proximity to the proposed roads. As for residential buildings and commercial shops, these were noticed more along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3).

Figure 4-11: Nearest Churches, Museum and School to the Roads within Project Area



Source: ACE

4.4 Summary of Baseline

The proposed roads lie within a range of 762 m to 1,128 m above sea level. The average annual temperature in the village is 15.3 °C and the average annual precipitation is 1169 mm. The main geological formation within the study area belongs to the following: Chouf Sandstone (C1), Hammana Formation (C3), Eocene (E2), Salima Limestone, Portlandian epoch (J7) and Pleistocene (Q). As for the water resources, there are streams along the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

Results of air quality data show that the concentrations of NO2 comply with the national standards and the WHO Guidelines. As for the concentrations of PM10, the obtained values were in compliance with the national standards and WHO Guidelines while PM2.5 were not in compliance with the WHO standards for air quality.

During the site visits in December 2018, different kind of trees and areas were observed such as the natural terrains with dense and low vegetation along the roads, in addition to agriculture areas and planted trees. Trees identified along the proposed roads were mainly Pine trees, Olive trees, Eucalyptus trees, Cypress trees and Oak trees and fruit trees. The Caza of Jezzine hosts Jabal el Rihane which is named as a UNESCO Biosphere Reserve (SOER, 2010), in addition to the 200 Ha Bkassine Pine Forest is listed as a protected forest and Hima (SOER, 2010). Yet, the Jabal el Rihane Reserve is at a distance of 9.4 km away from the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. On the other hand, the Bkassine Pine Forest is at a distance of 1.3 km away from the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-3).

Azour and Btedine El Laqch are relatively the villages with denser population within the study area. Alongside the proposed roads is also a low vegetation cover and some agricultural areas. Furthermore, no livestock farms were noticed along one of the roads.

The total resident population in the Jezzine District is 25,126 inhabitants, 3,050 and 1,812 of which are registered Syrian Refugees and Palestinian refugees respectively (OCHA, 2016). The number of Syrian Refugees along the main villages through which the proposed roads pass is 593 (UNHCR, 2019). The economic activities that exist along the proposed roads included small facilities and shops in different fields and car maintenance shops mainly along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3).

Figure 4-11 and Annex 1 show the exact location of the churches along the proposed roads.

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 Jezzine Caza.

5.1 Assessment Methodology

The evaluation of potential environmental and social impacts was based on relevant 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 Jezzine 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). For example, the different shops and the car maintenance shops that are located along the proposed roads (Section 4.3.2) will benefit from the workers during the rehabilitation activities as workers will buy materials from these small shops.. 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 potential 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

Most 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. 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 especially that there are several water streams on the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein as shown in the Figure 4-2.

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

5.3.1.1 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 severe 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 water courses, streams and soils if not discharged and managed properly.

5.3.1.2 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. If the wastewater, generated from the workers' accommodation sites or porta cabins, 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 where water was identified based on the hydrological map (4.1.3) which showed that there are several water streams proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

5.3.1.3 Accidental Spillage

Water and soil can be polluted as a result of accidental oil and lubricant spills from the equipment used for rehabilitation of the roads. The spills may occur from the transportation of oil and lubricant and during re-fueling of oil supplies for machinery generators. 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 the waterbodies during the rehabilitation of the proposed roads affecting negatively the water streams along the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein. During site visits, water channels were detected alongside the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) at stations S0, S225, S650, S770, S900, S1000, S1500, S1700, S2700 and S3100. Also, water channels were seen at the stations S0 and S300 alongside the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

5.3.1.4 Solid Waste Generation

The rehabilitation activities of the roads may generate solid waste from construction workers, construction materials such as 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 the nearby water courses of roads. Furthermore, in the case of an accidental event of 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 on 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 especially where the proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) passes through the moderately populated residential areas in Azour and Btedine El Laqch villages. Also, the proposed roads are located and near Pine, Eucalyptus, Cypress and Olive trees that dominated the majority of the sides of the proposed roads. 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. In the case of an accidental event of 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 Jezzine 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 Jezzine Caza that require new pavement are as follows:

- From Station 1+000 to 6+128 of Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1).
- From Station 3+100 to 5+507 of Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-2).

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. It is important to note that the improper disposal is not an adopted measure but rather an accidental one.

Thus the generation of odor emissions during rehabilitation is considered a negative impact (N).

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 the relatively denser populated areas in Azour and Btedine El Laqch through which the proposed roads Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) passes. 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 Energy and Water Consumption

During the rehabilitation phase high consumption rates of fossil fuel is required for the operation of heavy machinery, generators and other construction equipment, thus contributing to overconsumption and depletion of fuel. In addition, 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. Energy and water consumption in the rehabilitation site may be overused causing overexploitation of energy and water resources. Moreover, the supply of water and electricity for the project activities might disturb the water and electricity availability and supply to the existing communities. 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, any potential 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 losses 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 illegal quarries will not 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 them. However, at certain sections some shrubs and trees 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 trees should not be removed before getting a permit from the MoA which is usually given conditional to the reforestation or a compensation paid by the contractor to the MoA in order to buy a number of new plants. However, in this proposed project trees will not be removed. As for shrubs, in case of removal, these are not of significant ecological 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, Eucalyptus and Olive trees that were present alongside the proposed roads. In addition, most of the area is dominated by a natural low vegetation cover while only some were covered by a denser vegetation cover. Moreover, none of these trees gender is considered as endangered.

Trees will not be removed within the area of the proposed project. Shrubs might be removed when necessary to carry out the rehabilitation works of the proposed road. In addition, the main rehabilitation activities that may have a negative effect on the study area flora are the activities of heavy machinery movement 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 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 slightly negative (N).

As for the fauna, no animals were observed during the site visits especially that the site visits were done during the winter while grazing activities occur during the other seasons. However, the animals that are present in the area and may approach or cross the proposed roads have the tendency to be disturbed and escape due to the noise and vibrations emanating from the undertaken activities as well as from the sources of light and generated dust. 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 due to the presence of heavy equipment and machinery, as well as sources of light, 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).

5.3.7 Existing Infrastructure

The rehabilitation works may impact existing below ground infrastructure including utility cables (phone, electricity, internet), sewage, and water networks. Unplanned digging and milling of deteriorated road pavement may damage the existing infrastructure that is possibly serving nearby areas and residents. This damage will interrupt the functioning of utility cables and will cut-off the operation of water and sewage networks. Consequently, the supply of water to nearby areas will be affected and residents or passengers may smell bad odors from contaminated water accumulated within the broken sewage network. This impact is temporary and will diminish as soon as the project is completed and is considered as slightly negative impact (N).

5.4 Potential Socioeconomic Impacts during Rehabilitation

5.4.1 Potential Labour Influx

Sexual Exploitation and Abuse (SEA) induced by the potential 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 gender-based violence (GBV) and sexual abuse and exploitation incidents (GGITR & GTGDR, 2018). Yet, the contractor will maximize efforts to hire local workers in order to prevent labor influx. If the latter is needed, it will be minimized as much as possible. This impact is considered to be negative (N).

5.4.2 Traffic

The REP rehabilitation works will not close or shutdown any road under study. The proposed rehabilitation activities and the on-site traffic management may pose a challenge for the circulation. As a result of rehabilitation works, the road width might become narrower and might experience a delay in traffic. Moreover, the movement of heavy machinery and rehabilitation activities may lead to temporary traffic jam or might result in accidents and cause inconvenience to the people using those roads especially at the relatively denser populated areas in Azour and Btedine El Laqch through which the proposed roads Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) passes. In addition, traffic could be disrupted by the rehabilitation activities throughout traffic diversions, detours or blockage.

In addition, traffic could be disrupted by the rehabilitation activities throughout traffic diversions, and detours. This would be the case if the Contractor will be obliged to temporary close the road.
As mentioned before, the location of these detours will be specified by the contractor during the rehabilitation phase however all detours (if needed) will be on existing alternative roads (public domain properties). 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

In case of potential labor influx, social tensions may arise between local and foreign workers should the former perceive that most of the job opportunities created are being offered to foreign workers. Social tensions between locals and foreign might also arise if they are not equally compensated as per the scale of market price rates. 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. There needs to be transparency, good communication and outreach, and robust GRM during project implementation to prevent, minimize or mitigate this perception. This impact is considered to be negative (N).

5.4.4 Child Labour

During rehabilitation works, 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 significant impacts on archaeological sites as the proposed roads are not located in close proximity to these sites. Although access to cultural sites such as the nearby churches and Farid Serhal Museum are unlikely to be disrupted due to the presence of at least 3m distance from these sites and the road alignment, measures need to be put in place to ensure this. During excavations, depth of excavations is not more than 15cm in roads sections, and not more than 1.5m for walls and 3 to 4m for new culverts). The impact is slightly negative (N).

5.4.6 Traffic & Accessibility

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. In addition, some disturbance might occur on the traffic movement as the proposed roads can be used in order to reach cultural heritage or touristic sites in the area as well as educational or health facilities in the region. This impact is therefore considered negative (N).

5.4.7 Economic Activities

During the site visits, different observations were recorded along both proposed roads, such as small facilities and shops in different fields, and car maintenance shops mainly along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3).

During the rehabilitation phase, the economic activity of these existing shops might be affected due to change of accessibility, the possible detours and diversions, presence of excavation activities and heavy machinery near those shops. Thus, causing nuisance to the shops owners and visitors of these features. Nevertheless, this impact will be limited for the duration of works on that section of the road. In addition, there are no expected physical impacts on houses or shops along the road, as the works are limited to the road corridor only and therefore there will be no encroachments on any private property. It is worth to mention that the shops are not located directly on the road alignment (usually there is a car parking space separating it from the main road alignment) and therefore access is not expected to be disrupted. This impact is temporary and will vanish as soon as the project is completed. As such, this impact is assessed as a negative impact (N).

On the other hand, as mentioned previously in Section 5.2, snack shops and other shops will benefit from the rehabilitation activities as workers will buy goods from these small shops. Therefore, the community affected by the roads under study is not expected to experience an economic displacement (loss of assets or loss of access to assets that leads to loss of income sources or means of livelihood).

It is important to note that no land acquisition will take place for the proposed project in Jezzine Caza and that the identified shops are not expected to close during the rehabilitation works. However, proper mitigation measures mentioned in section 6.3.1.1 need to be implemented by the contractor to minimize any nuisances from the construction activities such as noise and dust emissions. These are only expected for a short duration.

5.5 Potential Health and Safety Impacts during Rehabilitation

5.5.1 Occupational 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 commuting 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 rehabilitation 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 rehabilitation 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 SO_2, NO_2 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 are associated with the generation of dust include 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).

Occupational health risks at construction sites also include:

- Over-exertion and ergonomic injuries from repetitive motion, lifting heavy objects, or working in an awkward position
- Slips and falls on the same elevation due to the presence of loose construction materials, oil or liquid spills, and unorganized electrical cords and ropes on the ground
- Falls from elevation associated with working with ladders (especially when rehabilitating street lights) causing of fatal or permanent disabling injury
- Direct injuries due to the movement of trucks and lifting equipment in the movement of onsite (WB-IFC, 2007).

5.5.2 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. In addition, the generated dust and noise from the rehabilitation activities can also cause health problems to nearby residents. Since this impact will vanish as soon as the project is complete, the impact of public safety is considered temporary and negative (N).

5.6 Potential Positive Impacts during Operation

5.6.1 Socioeconomic Environment

5.6.1.1 Economic Activities

Once the project is completed the improved infrastructure will encourage new business opportunities and marketing activities in project region. Moreover, female participants in the public hearing believed that during operation the project will contribute positively to improving their participation in the economy by making transportation easier, safer and convenient.

Tourism is expected to increase in the region since the improvement of the road infrastructure conditions in the region will attract more visitors (WB/GoKP/IDA, 2019).

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

5.6.1.2 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 5.8.1.

5.6.2 Cultural Heritage

Some churches were identified along the proposed roads and Farid Serhal Museum was located at around 200 m from road L3-JE-RD01-c. However, there is no evidence of any archeological vestige in the location of these roads. Thus, the proposed project will not impact the cultural heritage of the region during the operation phase. However, the improvement of road conditions will enhance touristic activities to historical and archaeological landmarks and the monasteries, churches, museums and other worship places in the region. Thus, it is assessed as a positive impact (P).

5.7 Potential Negative Environmental Impacts during Operation

5.7.1 Soil & 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. Although the project will include the rehabilitation of drainage system, these systems could be blocked by sediments and debris leading to storm water overflow. If overflow occurs, this water might be transported into nearby water bodies and soils. 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 negative (N).

5.7.2 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, NOx, SOx, PM_{10}) 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).

5.7.3 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).

5.7.4 Use of Natural Resources

5.7.4.1 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).

5.7.5 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 behavior. 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 condition 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).

5.7.6 Visual intrusion

As the project is the rehabilitation of existing roads in Jezzine Caza, the surrounding environment, vegetation, and the aesthetical value of the surrounding areas is not likely to be significantly affected. The impact is therefore evaluated as neutral (O).

5.8 Potential Health and Safety Impacts during Operation

5.8.1 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 Jezzine. As such, this impact is evaluated as negative (N).

5.9 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, NOx, SOx, PM_{10}) 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	Biodiversity and sensitive habitats	N

Impact	Media	Nature
escape from noise and vibrations		
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	N
Disturbance of animals in the area	Biodiversity and sensitive habitats	N
Potential damage to existing infrastructure	Existing infrastructure and nearby communities	N
Socioeconomic		
Creation of job opportunities for local communities	Local workers, 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
Small shops will benefit from workers buying goods	Shop owners/renters	P
Potential Labour Influx	Foreign Workers	N
Possible unequal wage benefits between local and foreign workers	Local and foreign Workers	N
Social tensions due to discrimination from the local community against the foreign workers in the event of potential labor influx	Foreign Workers	N
Social tensions in the event of potential labor influx 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
Potential child labor for construction activities	Local and foreign children	2N
Traffic congestion in the concerned towns	Nearby communities, socio-economic	N

Impact	Media	Nature
due to transport of construction materials, the material that may fall or due to temporal road closure	activities	
Potential occurrence of sexual abuse and exploitation and GBV incidents	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 in access to shops, nearby churches and Farid Serhal Museum as a result of rehabilitation activities and possible detours and diversions, thus affecting livelihood of shops' owners, visitors of the nearby churches and the museum	Shop's owners and church visitors	N
Material falling from vehicles during transport may cause traffic accidents or congestion	Nearby communities	N
Community and Worker Health and Safety		
Accident and injuries to workers because of construction activities risks and injuries include: respiratory health risks, over-exertion and ergonomic injuries, slips and falls	Workers	2N
Injuries from car accidents due to the presence of construction sites and closure of some roads	Nearby communities	N
Dust generation and noise may cause health related problems to nearby residents	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 storm water overflow polluting nearby surface and groundwater bodies	Water resources, soil, subsoil and land, nearby communities	N
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	Socio-economic activities, nearby	2P

opportunities, and marketing activities in project region, the increase in land values and facilitate the access to services and improve the living standards	communities	
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 Worker Health and Safety		
Increased traffic, accidents rates and risk on pedestrians,	Socio-economic activities, 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 courses and avoid working in rainy weather. The contractor should also ensure that the volume of cut will be disposed properly during the rehabilitation phase in controlled disposal sites to be identified by the contractor in coordination with the relevant municipality. It is also recommended to reuse the excavated material whenever possible. In addition, the contactor should ensure that proper waste management practices are being implemented and train workers on waste reduction procedures including reuse or recycle the generated waste whenever possible.

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 if any. In addition, the discharge of wastewater into nearby water courses should be prohibited under any condition especially that there are several water streams proposed road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) and the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein.

In addition, the contractor should present and abide by a spill prevention and management plan that includes the following:

- Proper handling of chemical and oil on a paved ground;
- Used oil or chemical must be stored in an appropriate area until it’s collected and disposed in licensed sites;
- A spill response plan including a spill clean-up procedure should be present at the construction site and all workers should be trained in order to implement it in case of accidental spillage;
- The reduction in use of chemicals and the regular maintenance of the used vehicles and machines;
- A spill collection tank must be installed under generators and specific equipment;
- Used oil from occasional maintenance of machinery should be collected in specific containers and stored on concrete ground.

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 during rehabilitation should be regularly maintained;

- Mix material in an enclosed space
- Open burning of solid waste must be prohibited;
- Vehicles must move at a low speed on unpaved (20-30km/h);
- 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 the moderately populated residential areas where the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3) passes through, 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:

- Use water efficiently and reduce water wastage whenever possible;
- Regular site inspection to detect water leakages;
- 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 rehabilitation activities should be obtained in such a way that doesn't disturb the water availability and supply to the existing communities;
- Regular maintenance of the generators and trucks;
- The light in the offices must be shut down during the night when offices are not in use;
- 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;
- Ensure that the borrow material are extracted from legal quarrying sites;
- Avoid agriculture land for borrow materials.

6.1.5 Land Cover and Biological Environment

As mentioned earlier, the flora within the project site will not be significantly affected; however, it is important to suppress dust by sprinkling water during rehabilitation especially when rehabilitation activities generate significant amounts of dust. It is also recommended not to undertake dust emitting activities during windy weather. This can minimize the impact of dust accumulation on nearby trees. Moreover, in case of any tree removal, ensure that the contractor will get a permit from the MoA prior to the removal on any tree which is usually given conditional to the reforestation or a compensation paid by the contractor to the MoA in order to buy a number of new plants.

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

- Maintenance of vehicles and machinery;
- Drilling, excavation and any other noisy activity only during working hours;
- Prohibit solid waste disposal into nearby areas.

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.

6.1.7 Existing Infrastructure

The impacts on the existing infrastructure were assessed as temporary and were considered as neutral. Following are the mitigation measures:

- Regular coordination with relevant municipalities and authorities should be done in order not to affect existing infrastructures (water, wastewater networks, phone cables...). Splitting works into the road segments will be done to ensure quick progression through roads while causing minimal disruption to traffic.

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. Although the project will include the rehabilitation of drainage system, however, local authorities are responsible for regularly maintaining these systems 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 and to prevent their blockage and storm water overflow. 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;
- Frequent air quality monitoring must be done along the roads area to ensure that ambient air quality parameters are within the standards.

6.2.3 Noise

Mitigation measures that should be implemented in order to minimize the traffic related noise include 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:

- If possible, 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 in undesignated locations areas;
- Ensure that the road is regularly maintained to ensure good surface conditions
- Plant some trees along the roads as proposed by the participants during the public hearing

6.2.6 Visual Intrusion

As the project is the rehabilitation of existing roads in Jezzine 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 given to qualified local residents, especially jobs that require skills 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 rehabilitation activities especially near residential areas;
- Ensure that the generated solid waste and liquid waste is disposed or discharged in an environmentally friendly way and in selected areas;
- Ensure GRM is accessible to local communities and workers to send their suggestions, concerns and complaints.

Moreover, as mentioned earlier, the owners of the identified shops mainly along the road Azour-Tiid-Harf-Btedine El Laqch (To Saida-Jezzine Road) (L3-JE-RD01-a-1, L3-JE-RD01-a-2, L3-JE-RD01-a-3),

and the visitors of both churches in Azour (L3-JE-RD01-a-1), the three churches in Btedine El Laqch (L3-JE-RD01-a-2), and the one church in Ain Majdlein along the road (L3-JE-RD01-c) which is the Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein 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:

- Ensure that access to small shops is not blocked by installing wooden boards where necessary;
- Maintain a passing corridor within the alignment to grant access to nearby properties;
- Inform the shops' owners ahead of time about rehabilitation date;
- Proper installation of sign boards;
- Timely completion of the rehabilitation phase;
- Proper communication and coordination with affected shop owners and robust GRM that is fully functional and operational that should be widely disseminated.

It is worth mentioning that shops will not be closed during the rehabilitation phase and if the proposed mitigation measures were undertaken properly, the livelihood of the shops' owners will not be negatively affected.

6.3.1.2 Potential Labor Influx

The proposed project is not expected to cause labor influx. Yet, in case of potential labor influx, the risk of sexual abuse and exploitation and sexual harassment induced by labor influx, should be reduced as much as possible. The contractor should implement the following prior to project rehabilitation:

Draft CoC and the guidelines for a GBV and Violence Against Children (VAC) Action Plan;

- Ensure that workers at the rehabilitation site understand and 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 possibly international consultants should sign CoC 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;
- Inform workers and the local communities that a GRM is available coordinate with the relevant municipalities and all affected parties in order to ensure that they are informed of all the contractor activities including a potential labor influx. The GRM should be widely disseminated and include an anonymous channel for potential gender-based violence survivors to report incidents channel to ensure confidentiality and protection to GBV survivors reporting incidents. (See more details in Section 8.2.2).
- Availability of a GRM with multiple channels to initiate a GBV complaint, which ensures confidential reporting with safe and ethical documenting of GBV cases, including Sexual Exploitation and Abuse and Sexual Harassment.

6.3.1.3 Social Tensions

The following mitigation measures must be implemented in order to minimize the social tension during the rehabilitation works between local and the foreign workers as a result of a potential labor influx:

- Conduct awareness campaigns for the local community regarding the potential foreign worker influx and how their engagement can affect the local economic sector in a positive way. These campaigns must also inform the local community that these workers will sign code of conduct before starting the work and thus their behavior will be controlled. There needs to be transparency, good communication and outreach, and robust and fully functional GRM during project implementation to prevent, minimize or mitigate this perception;
- 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 opportunities.
- 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 measures 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;
- Oblige the contractor to strictly abide by the Labor Law through the CDR tender documents that should include prohibition 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 & Road Safety

As mentioned earlier, improving the conditions of the road will lead to enhanced vehicular movement and speed thus increasing the chances of road accidents. However, implementing the several mitigation measures can decrease the possibility of such accidents and protect pedestrians. Implementing the following measures can also minimize the traffic congestion and resident's inconvenience and ensure road safety during the rehabilitation of the roads:

- Install safety walls, safety signs, speed limit signs and speed bumps along the proposed roads;
- Ensure that the road is regularly maintained to ensure good surface conditions;
- Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage;
- 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;
- Inform public about schedule of rehabilitation and place signs near the working areas;
- Take into consideration to restrict the period of rehabilitation works during summer as suggested by the women during the public hearing session;
- Prepare and abide by a Spill Prevention & Management Plan;
- Abide by traffic regulations;
- Install proper warning in culturally appropriate languages and written in clear and understandable manner;

- 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;
- Ensure access to external GRM.

6.3.2 Cultural Heritage

The proposed project is located within an area that does not include archaeological sites. 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. Moreover, the contractor should ensure the access to the cultural sites that includes the six churches and the museum of Farid Saleh is not blocked and easily accessed through the wooden structures if necessary.

6.3.3 Existing Infrastructure

Regular coordination with relevant municipalities and authorities should be undertaken in order to avoid any existing infrastructures along the road (water, wastewater networks, phone cables) and in case of accidental damage, coordination with the relevant authorities should be undertaken immediately to avoid interrupting any services from the local population.

6.4 Community and Worker Health and Safety Measures during Rehabilitation

6.4.1 Occupational Health Safety

6.4.1.1 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 the rehabilitation 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 rehabilitation activity;
- Boots with slip-resistant and puncture-resistant soles should be worn by the workers on construction site;
- Contractors should submit an Occupational Health and Safety plan to be reviewed and approved by the Supervision Engineer;
- The contractor should abide by the assigned work schedule (OSHA, 2011).

In order to minimize the occupational health risks, the following mitigation measures must also be implemented at the construction site:

- Training of workers in lifting and materials handling techniques;

- Planning work site layout to minimize the need for manual transfer of heavy loads;
- Implementing administrative controls into work processes, such as job rotations and rest or stretch breaks;
- Sorting and placing loose construction materials or demolition debris in established areas away from foot paths;
- Cleaning up excessive waste debris and liquid spills regularly;
- Training and use of temporary fall prevention devices, such as rails or other barriers able to support a weight;
- Planning and segregating the location of vehicle traffic, machine operation, and walking areas, and controlling vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic;
- Ensuring moving equipment is outfitted with audible back-up alarms (WB-IFC, 2007).

In addition, effective Occupational Health and Safety Plan for rehabilitation 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;
- Sanitary facilities to be covered, easily accessible, ventilated, well lit, maintained, and sanitized;
- Safe drinking water in accordance with regulations.

6.4.1.2 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.

6.4.2 Community Health and Safety

Local resident and passer-by safety 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, medical centers, hospitals and shops) as well as physical obstacles such as bumps and rumble strips;
- Secure the site and restrict access to it;

- Access to hospitals should not be impeded at no time;
- Training of heavy machinery drivers about road safety;
- Inform the local community about the rehabilitation 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;
- Ensure access to external GRM.

6.5 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.

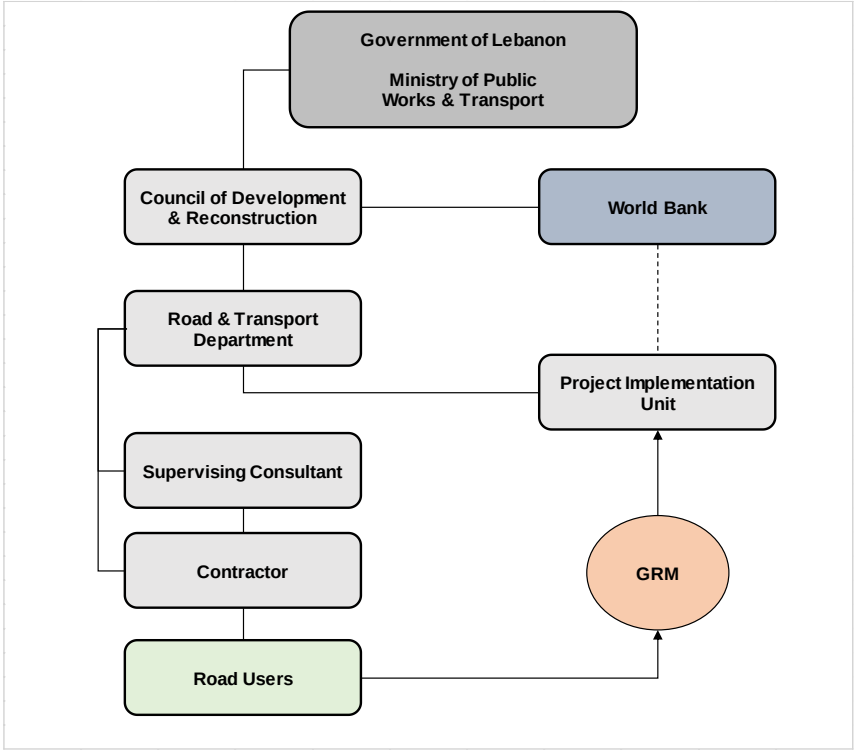
In order to achieve proper environmental and social management and monitoring, a clear, functional institutional structure was defined (refer to Figure 7-1). During the rehabilitation phase, the contractor would be the primary actor; ensuring compliance of works with the different items specified in 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 and social 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 and social 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 Redress Mechanism (GRM) process through a local GRM based in each project site road location for local communities' accessibility.

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 and social 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 and social laws, regulations, and standards;
- Traffic and Road Management System;
- Occupational hazard and personal protective equipment;
- Emergency response and chemical spills;
- Sampling techniques and environmental and social 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 and Social Mitigation Plan for road rehabilitation project during the rehabilitation and operation phases respectively. The plan for the rehabilitation 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 rehabilitation phase.

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

Project Activity	Potential Impact	Proposed Mitigation	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 undesignated sites	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 Used oil from occasional maintenance of	Contractor	Supervision Engineer	5,000 $

Project Activity	Potential Impact	Proposed Mitigation	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	machinery or chemicals must be stored in an appropriate area until it's collected and disposed in a controlled disposal 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 site			
	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 site 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 Machinery and equipment must be turned off when not in use	Contractor	Supervision Engineer	5,000 $

Project Activity	Potential Impact	Proposed Mitigation	Responsibility of Mitigation	Responsibility of Direct Supervision	Estimated Cost
	High consumption rates of water for construction related activities Reduction in overall ground and surface water quality due to improper disposal of construction waste	Use water in the most efficient way and reduce wastage Regular site inspection to detect water leakages 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	Contractor	Supervision Engineer	5,000 $
	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	Contractor of the quarry site	Supervision Engineer	
	Potential disruption of existing flora	Suppress dust by sprinkling water during rehabilitation In case of any tree removal, ensure that the contractor will get a permit from the MoA	Contractor	Supervision Engineer	-
	Social Impacts				
	Temporary potential Labour Influx	Priority hiring to qualified local community GRM for local communities	Contractor	Supervision Engineer	-
	Economic Activities and its effect on the livelihood of the shop owners Disturbance of visitors and the access to the six churches and Farid Serhal Museum	Install overpass structures from the road to the shops, churches and museum Maintain a passing corridor within the alignment to grant access to nearby properties Ensure that access to small shops, churches and museum is not blocked by installing wooden boards Inform the shops' owners, churches and the museum ahead of time about rehabilitation date	Contractor	Supervision Engineer	-

Project Activity	Potential Impact	Proposed Mitigation	Responsibility of Mitigation	Responsibility of Direct Supervision	Estimated Cost
		Proper installation of sign boards in culturally appropriate languages and written in clear and understandable manner Timely completion of the rehabilitation phase Ensure access to external GRM			
	Discrimination from the local community against the potential influx of 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 starting the work GRM for local communities and all relevant stakeholders	Contractor	Supervision Engineer	
	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 internal 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 National 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	Contractor	Supervision Engineer	-

Project Activity	Potential Impact	Proposed Mitigation	Responsibility of Mitigation	Responsibility of Direct Supervision	Estimated Cost
		Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage Ensure access to external GRM			
	Damage of existing infrastructure	Regular coordination with relevant municipalities especially where new infrastructure project such as the installation of new wastewater network are planned Conducting trial pits	Contractor	Supervision Engineer	-
	Potential occurrence of gender-based violence, sexual abuse and exploitation incidents	Draft CoC and the guidelines for a GBV and VAC Action Plan All workers should understand, and sign CoC written in their native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority Regular training on gender-based aspects, internal and external GRM that includes an anonymous channel for protection of complainants' identity and confidentiality Availability of a GRM with multiple channels to initiate a GBV complaint, which ensures confidential reporting with safe and ethical documenting of GBV cases, including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Contractor	Supervision Engineer	-
	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 in culturally appropriate languages and written in clear and understandable manner Ensure communities have access to GRM Cover transported material	Contractor	Supervision Engineer	1,500$
	Traffic congestion in the town due to temporal road closure				
	Material falling from vehicles				

Project Activity	Potential Impact	Proposed Mitigation	Responsibility of Mitigation	Responsibility of Direct Supervision	Estimated Cost
	during transport may cause traffic accidents or congestion	Abide by traffic regulations Operate well maintained vehicles			
	Accident and injuries to workers and public because of rehabilitation activities Dust generation and noise may cause health related problems for workers and disturbance to residents	Workers to wear proper safety gear (PPE) Presence of first aid kits (at least three) on the construction site 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	Contractor	Supervision Engineer	3,000 $
	Community and Worker Health and Safety				
	Accident and injuries to workers and public because of rehabilitation activities Dust generation and noise may cause health related problems for workers and disturbance to residents	Develop and implement a site-specific Public Health and Safety Plan and Occupational Health and Safety Plan Workers to wear proper safety gear (PPE) Presence of first aid kits (at least three) on the construction site Inform residents and place signs near the working areas Proper management of trucks and heavy machinery entering and exiting the construction site Apply Best Applicable Practices on Road Safety	Contractor	Supervision Engineer	3,000 $
Operation	**Environmental Impacts**				
	Increased vehicular pollutant levels (CO, NOx, SOx, PM_{10}) in the area causing public health	Ensure that the road is regularly maintained to ensure good surface conditions Frequent air quality monitoring must be	Local authorities	-	3,000 $

Project Activity	Potential Impact	Proposed Mitigation	Responsibility of Mitigation	Responsibility of Direct Supervision	Estimated Cost
	risks and other impacts on the environment.	done along the roads area to ensure that ambient air quality parameters are within the standards			
	Blockage of drainage systems and overflow of storm water transporting residues and pollutants to nearby water bodies and soils	Ensure that the drainage system is regularly maintained especially before the start of the rainy season and that solid waste is continually collected	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	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 streetlight infrastructure to reduce the consumption of non-renewable sources of energy	Local authorities	-	Quotation to be provided from local or international suppliers
	Disruption of animalmovement 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 were animals cross the roads	Local authorities	-	2,500
	Community and Worker 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 and social management and implementation of a monitoring plan, the rehabilitation of the roads in Jezzine 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 rehabilitation a Health, Safety and Environmental Officer and a social development consultant 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 4-11.
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 rehabilitation 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, attendance sheets to GBV trainings, worker's age, GRM log, etc…
- 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. In addition, there should be immediate reporting of severe incidents (such as fatal accidents).

7.3.2.2 During Operation

Quarterly environmental and social monitoring reports should be prepared to analyze the collected data, assess monitoring activities and provide recommendations to ensure the effectiveness of the overall environmental and social 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 shows the Environmental and Social Monitoring Plan for the rehabilitation and operation phases.

Table 7-2: Environmental and Social Monitoring Plan during Rehabilitation and Operation Phases

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
Rehabilitation	**Environmental Impacts**						
	Air pollution (Dust /GHG Emissions)	• Volume of dust dispersion • Plume color	Supervision Engineer	Weekly and during activities that generates significant amount of air pollutants	Throughout the project area near sensitive receptors	Visual observation and photographic documentation 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 and Light Pollution	• Leq, Lmin and Lmax	Supervision Engineer	Weekly and during activities generating significant noise levels or upon receiving a complain	Throughout the project area near sensitive receptors	Single sample per location (average 1hr reading-15minintervals) 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	• Check for leakages in the connections between the porta cabin toilets and the existing network or polyethylene tank	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
	domestic wastewater from workers and liquid waste from rehabilitation activities	• Check the discharge endpoint of the pumped wastewater from the polyethylene tank • Effluent from construction activities (Concrete mixing, dust minimizing, washing of equipment…)					
	Contamination of surface water bodies and soil from the generated solid waste	• Ensure active solid waste management plan • Construction and demolition waste • Waste of the workers on site	Supervision Engineer	Weekly	Collection points present on sites	Visual inspection	-
	Reduction in overall surface water and soil quality Accidental Releases	• 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	• 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	• 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	-

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	Destruction of existing Land Resources	• 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 rehabilitation activities	• Site observation	Supervision Engineer	Weekly	Around proposed roads	-	-
	Social Impacts						
	Traffic congestion	• 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	• Proportion of Lebanese vs Syrian workers • Worker's age • GRM log • Attendance sheets to GBV trainings • Number of workers trained to SEA	Supervision Engineer	Monthly			

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
		• Number of workers who signed Code of Conduct					
	Labor Influx	• Number of reported Sexual abuse and exploitation (SEA) incidents	Supervision Engineer	Monthly			
		• Number of reported inappropriate communication and language incidents among the workers	Supervision Engineer	Monthly			
	Community and Worker Occupational Health and Safety						
	Accident and injuries to workers	• OHS plan approved by the Owner and implemented by Contractor. • Worker training records • Permit to Work for high risk activities • OHS supervisor notes • Ensure signs are in place before works begin • Visual inspections to ensure that all workers are wearing their PPEs • Accident log recording injuries and accidents within the workers	Supervision Engineer	Daily	Along the proposed roads	Visual inspection Accidents records	-
	Accident and injuries to the public	• Ensure the installation of pedestrian and vehicular	Supervision Engineer	Daily	Along the proposed roads	Visual inspection Accidents	-

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
		passages near residential areas • Ensure road diversion and construction attention signs are in place before works begin • Record injuries and accidents within passers-by • Site-specific Public Health and Safety Plan approved by Engineer and implemented by contractor • Best practices are applied • Community complains				records Complains	
Operation	**Environmental Impacts**						
	Water and soil pollution (Storm water overflow due to drainage systems blockage)	• Clean water drainage systems • Visual inspection of water over flows on the roads	Local authorities	Before the beginning of the winter season	Along the drainage systems and culverts	Visual inspection	-
	Air pollution (dust emissions)	• Total Suspended • Particles (TSP), PM10, • PM2.5 (wherever feasible), SOx, NOx and CO	Ministry of Environment	As nationally or locally planned or upon community complain	At main receptors along the proposed roads	1-hr and 24-hrmeasurements ,and visual observation of dust dispersion(scale and direction)	Within MOE budget

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	Noise pollution	• Leq, Lmin and Lmax	Ministry of Environment	As nationally or locally planned or upon community complain	At main receptors along the proposed roads	Single sample per location (average1hr reading-15minintervals) during morning (7-8am), evening (1-2pm) and night (4-5pm)	Within MOE budget
	Community and Worker Health and Safety						
	Car accidents	• Number of car accidents • Cause of accidents • Location of accidents	Traffic 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 rehabilitation should include at least the following components:

- Proper signage in and around the site in local languages and access to an internal GRM;
- 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 (washing basin, urinal);
- Sanitary facilities to be covered, easily accessible, ventilated, well lit, maintained, and sanitized;
- Safe drinking water in accordance with regulations.
- Access to an Internal GRM.

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 Jezzine Municipalities on Friday, 3 January 2020. The purpose of the hearing was to inform the stakeholders including the municipality representatives, local residents, NGOs and the public about the proposed project that will rehabilitate two roads in Jezzine 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 concerned municipalities to ensure proper representation of various communities. Moreover, different NGOs were invited to the public hearing. Table 8-1 represents the name of the invited NGOs and their work.

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

A total of Twenty-seven people participated in the meeting in the Jezzine Caza including 4 women. 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.

During the session, different concerns were raised by the attendees as follows:

- Participants asked how the local community will benefit from the proposed project during the rehabilitation phase, specifically if the CDR would assign contractors from the local community or not. CDR responded by noting that CDR has a list of certified contractors and for this project and the contractor must be within this list.
- Questions were raised regarding the origin of the raw material that will be used during the rehabilitation phase. Participants were requesting to purchase the raw material from the local community. CDR responded that if the required raw material is available with the required specifications, the contractor will definitely purchase it from the local, as he will save more.
- More than one participant were asking about the criteria that were taken into consideration when selecting the roads. The consultant and CDR responded to this comment by noting that a study was done for the selection of roads taking into account the current conditions of the roads and budget issue.
- The head of union of Jezzine municipalities noted that in the future other roads will be rehabilitated in the Caza from other sources of funds (EIB, JICA…). It was requested to coordinate with the municipalities before starting the road rehabilitation work not to double the excavation work if the municipality is planning to do any infrastructure project (sewerage networks, electricity cables, etc.…). The head of the union responded to this by noting that a meeting will be held in order to identify all the planned infrastructure projects and determine whether these projects interfere with the rehabilitation of the proposed roads or not.
- One of the participants requested to plant some trees along the roads and construct retaining walls especially that at one of the proposed roads the retaining wall is in poor conditions. CDR and the consultant responded by ensuring that this will be covered under the proposed project. In general, the public supports this project and do 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 Jezzine 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:

- None of the women voiced out any concerns related to restriction of movement during the rehabilitation works due to the potential influx of workers to the area. However, the women felt that it is important to hire local workers in such projects. The consultant said that they will raise this issue to the contractor.
- All women agreed on the fact that the project will affect the cleanliness of their houses during the rehabilitation phase especially if the proposed road passes near residential areas. However, they said that they will be patient during this phase since the end result will be a safer road to pass on. In any case, the contractor should inform residents of the timing of construction works in order to minimize this impact. This measure has already been included in the ESMP.
- All women felt that it is important to install warning signs during the rehabilitation phase to inform the commuters about road closure or rerouting directions. They also ensured that flash lights must be installed at the project site at night. The consultant said this will be to taken into consideration and will ensure that the contractor will implement all safety measures that were proposed in the design
- They believe that during operation, the project will contribute positively to improving the economy in a direct and indirect way.

Moreover, GBV aspects and GRM are to be clearly communicated to women in these communities before project implementation and to be documented accordingly.

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. During the public consultation, Caritas-Jezzine NGO and Mar Maroun Association attended. They consist of two levels as follows:

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 Jezzine Municipalities on Friday, 3 January 2020. The local NGOs that were invited to the hearing are represented in Table 8-1 along with their names and their field of activity. However, two NGOs that were not listed in the table attended the session. These are Caritas-Jezzine and Mar Maroun Association. Those local NGOs may serve as advocates to reduce projects' social and environmental risks and promote good practice. They believe this project can have a positive impact if the associated risks, during both the rehabilitation and operation phases, are minimized and good practices are put in place.

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

Name of NGO	Activity
Environmental Protection Society in Jabal Al-Rayhan	Works to maintain a balance between human development and natural resources protection
Green Future Society	Promotes health education, healthy community, healthy environment, preventing pollution and improving agricultural production by educating farmers

Name of NGO	Activity
Social Cultural Association	Works to develop cooperation and friendship among the members of the community of the town, to encourage and highlight cultural energies and to establish charitable, social, cultural activities in cooperation with the active bodies in the town
The Cultural Council of Jezzine District	Promotes the importance of culture and its preservation through several activities (literary, artistic and developmental)
Lebanese Association for Rural Development	Promotes environmental and human sustainable development through the mobilization of the local communities
SOS	Supports the right of the children who are deprived of parental care or at risk of losing it by providing them with family-based care and preventing child abandonment

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.

Registered Syrian refugees in Jezzine Caza were also 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	• 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

NGO Name	Contacts	Intervention Sector(s)	Comments
			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	• 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.

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 are two mechanisms for filing a grievance, one for the surrounding communities and one for the workers. Moreover, GRM will be disseminated to the affected municipalities prior to rehabilitation works. 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 complaint 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 Jezzine Caza, before commencement of project implementation. Moreover, the information on how to access the GRM should be available through billboards, CDR website (http://www.cdr.gov.lb/study/RoadsEmp/RoadsEmp.htm), etc.

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

- 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 Jezzine 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 Environmental and Social Specialist of the PIU for the project through e-mail (rstephan@cdr.gov.lb), phone call or text message (01980096 ext:317), or website link (http://www.cdr.gov.lb/study/RoadsEmp/RoadsEmp.htm). The issue shall be resolved within a maximum of two weeks.
- Level 3: If the person is not satisfied with the decision of the Environmental and Social Specialist of PIU, he or she can bring the complaint to the attention of the PIU Director's Office through e-mail (elieh@cdr.gov.lb), phone call or text message (01980096 ext:159), or website link (http://www.cdr.gov.lb/study/RoadsEmp/RoadsEmp.htm). Once the PIU Director receives the complaint, it needs to be resolved within a maximum of two weeks.

Meanwhile, it is recommended that a feedback mechanism should be in effect as part of the GRM process so 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 PIU should be done on a monthly basis except for urgent cases. The designated person at each level should report to the PIU 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 PIU of complaints that could not be resolved at the lower levels and are being elevated to the PIU Director's attention. The PIU 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 as an optional field in case the complainant wishes to remain anonymous;
iii) Date;
iv) Length of time needed to close the complaint case;
v) Corrective actions taken in response to the complaint.

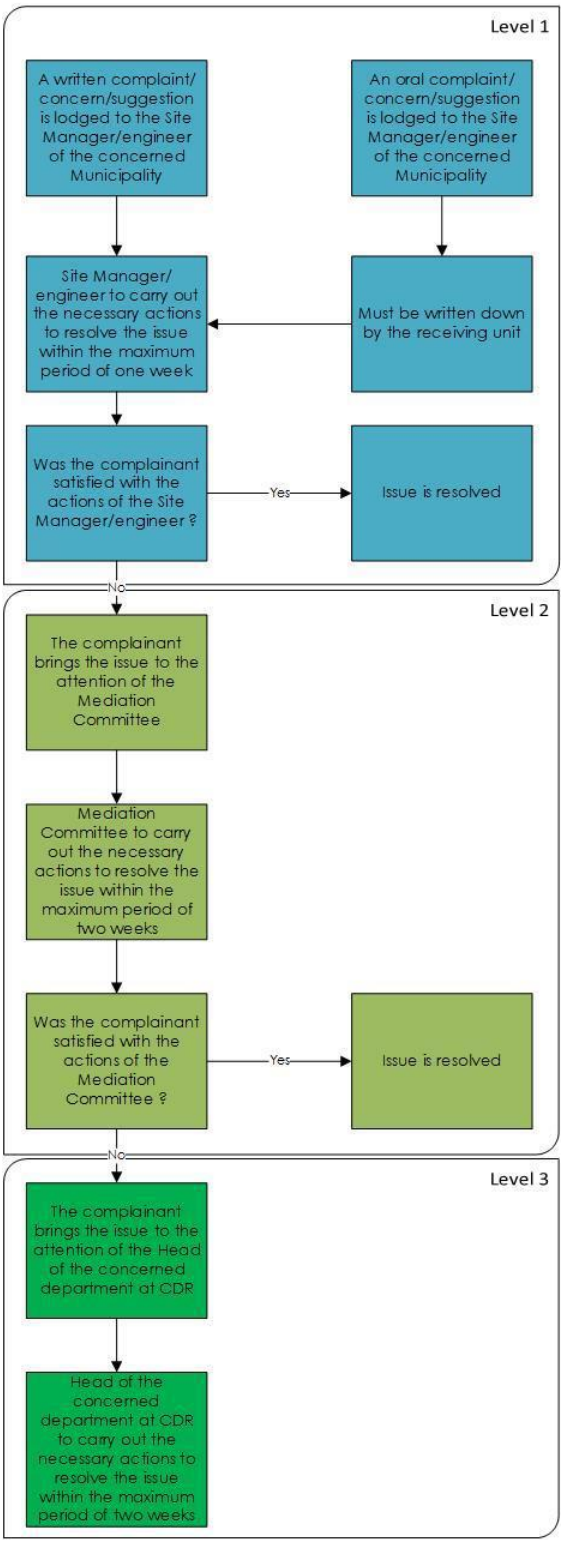
The GRM does not exclude the formal legal process of the national law. If a grievance remains unresolved following application of the project GRM process, the affected person can initiate legal proceedings in accordance with national law and may have recourse to the Appeals Court as warranted.

Figure 8-1 (overleaf) presents a detailed flowchart describing the process of grievance starting form 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 labors 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 of the contractor and has a duration of one week. The second level involves reporting to the PIU Director and should be resolved within two weeks. It also follows the Complaints Register form (refer to Annex 4).

Figure 8-1: Grievance Mechanism Process



Source: CDR, 2018

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 to increasing vehicular pollutant levels (CO, NO_x, SO_x, PM_{10}) 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 Jezzine 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: ENVIRONMNETAL AND SOCIAL COMPONENTS ALONG THE ROAD

Road Code	CAZA	Name	Natural Environment (Trees, land use, surface water …)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals, …)	Socio-Economic (Shops, Residential areas, traffic, …)
Road 1a	Jezzine	Azour - Tiid - Harf - Btedine el Laqch - (to Saida - Jezzine road)	S0: Pine and oak trees S120: pine and oak trees S300: pine, oaks and shrubs S500: oak and pine trees S750: Green areas of pine, oaks and shrubs (dense on the right) S1000: Dense green areas on the right S1250: Green areas S1400: Olive orchards on either road sides S1500: dense green areas of pine and oaks S1900: green areas on either road sides (pine, cypress and oak) S2250: small pine trees on either roads sides, Eucalyptus trees S2300: Eucalyptus row on left, olive orchard on right S2500: Pine trees on either road sides, oak, a cedar, a willow, vineyard S2700: cedar, willow, pine and cypress trees S2800: Eucalyptus, pine S2950: small pine trees on either road sides, oak on the left and olive orchard on the right S3100: Pine trees S3500: Olive orchards on either road sides, oaks and a dense forest pine area S4000: dense pine area, oaks, fruit trees, valley on the right, dense forest on either road sides S4400: dense forest (Brutia pine and oaks), fruit orchards on either road sides, agriculture areas with greenhouses S5000: greenhouses and dense pine forest S5100: dense pine forest S5350: dense pine forest on left, olive orchards on right	S0: Road with patchwork, wall fence on the left S120: Rocky wall fence, water channel (right), waste bins S300: rocky wall S500: waste bins, lightening, no traffic signs, road (4 to 5 m) S750: Retaining rocky wall (4 m) that needs maintenance, infrastructure supply on the left S1250: dense road cracks along the road width S1500: Water channel (culvert), cracks S1900: cracks and road settlement S2250: Rocky wall on the right S2300: retaining wall on left, water infrastructure (left), another retaining wall on the left (15 m) S2500: Retaining wall (75 m), interceptor for storm water S2800: Waste bins S2950: Increase in road cracks, rocky walls S3100: Water channel (culvert) on the road width S3200: settlement and deteriorated road S3500: road settlement S4000: Towards Bisri, many retaining walls, excavation infrastructure on right (wastewater), crossroads, road cracks S4400: No protection towards cliffs, deteriorated roads due to the absence of storm water channels S5100: Bad asphaltic patchwork and manholes	S0: building under construction, few residential buildings S300: Some residential buildings on the left S2500: residential buildings on the left S2680: Church on the left, greenhouses S2700: few residential buildings S4000: Church on left, few residential buildings S5600: facility on the left …… Towards Tiid S620: Few residential buildings …… Towards Harf S2700: Villa on the right …… Btedine El laqch S3450: Residential on the left S4700: Few residential buildings S5100: municipal sport stadium …… Mafraq Btedine El Laqch – Tiid S325: few residential buildings S500: few residential buildings S1350: Church and cemetery S1700: residential area S1900: Municipality on left

Road Code	CAZA	Name	Natural Environment (Trees, land use, surface water …)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals, …)	Socio-Economic (Shops, Residential areas, traffic, …)
			S5600: Olive orchards on either road sides, dense pine forest S6200: Olive orchards on either road sides, grass area on left …… Towards Tiid S0: Fruit orchards S315: oak and pine, rocky cliffs S720: olive, pine and other trees …… Towards Harf S1000-S2700: Pine trees …… Btedine El Laqch S3750: Cypress trees S4700: pine trees …… Mafraq Btedine El Laqch - Tiid S0: Pine trees S100: Pine trees on either road sides S325: Pine and Cypress trees S500: Cypress and pine S650: Pine trees S770: Pinus pinea S900: Pinus brutia and pinea S1000: Olive orchard S1300: Cypress, pine, oak and other trees S1500: Rocky cliffs on right, cypress and pine	S5350: Infrastructure on right S5600: cracks S6200: Sher Bisri, cracks S6400: cracks, culvert, Bisri road …… Towards Tiid S0: Road in bad condition, excavations for infrastructure on right S315: box culvert, excavations for infrastructure on right and left S720: waste bins, electric poles …… Towards Harf S1000: No lightening S1320: Box culvert, road ratting and bumps S1400: Settlement, cracks and manholes S1750: Deterioration of road sides (no storm water channels) S1800: deterioration of road, retaining wall (10 m; 3m) S2700: Road in bad condition, water channel on left S2900: Road in bad condition, excavation works for water supply on the right S3000: Retaining wall (1.5 m high) S3450: Btedine El Laqch, road in bad condition, rehabilitation works, storm water channel (left), power generator on the road side (right) S3750: Asphalt in good condition, few manholes S4500: Infrastructure works (Telephone)	S1900: Church S2100: Residential area S2400-S2500: Few residential buildings S2650: Villa on left S5650: Church on the left …… Towards Sabbah S0: Barber shop (right) S370: Car maintenance shop, residential buildings S575: villa on left S900: restaurant on left Roum Public school and Jezzine Public Primary School which are located at 1km and 1.8 km from this road

Road Code	CAZA	Name	Natural Environment (Trees, land use, surface water …)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals, …)	Socio-Economic (Shops, Residential areas, traffic, …)
			S1700: Cypress trees on left S2000: Olive orchard S2100: Palm trees S2250: Pine trees S2400: oaks S2500: Olive orchard on left S2600: pine and shrubs S2650: pine trees S3000-S3500: pine trees with some oaks S3650: Rocky cliffs on left S3800: pine forest trees S4050: Olive orchard and rocky cliffs at right S4200-S4500: Pine forest S4700: Olive orchards on either road sides, pine trees S5000: olive orchards S5350: Olive orchards …… Towards Sabbah S0: fenced pine trees S370: Pinus pinea	S4600: Retaining wall on the right (30 m) S4700: 3 Retaining walls, telephone infrastructure S5100: retaining wall …… Mafraq Btedine El LaqCh – Tiid S0: sidewalks with metal fences on the left, water channel on the right S225: Retaining wall (1m high), water channel S325: retaining wall on the left, small rocky wall on the right S500: retaining walls, waste bins S770: waste bins and water channel on right S900: cracks, water channel S975: Retaining wall (left), cracks S1000: water channel (right) S1500: water channel (right) S1700: sidewalks (right), water channel on right S1900: Works along the road S2000: waste bins S2200: Base coarse S2250: Base coarse, wastewater supply on left S2400: Base coarse S2500: Base coarse S2650: Water channel on right S2800: Valley on left, road needs storm water channels to decrease deterioration of road sides S3000: road (4 to 5 m width) S3450: Deteriorated road S3650: Retaining wall right (30 m), channels	

Road Code	CAZA	Name	Natural Environment (Trees, land use, surface water …)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals, …)	Socio-Economic (Shops, Residential areas, traffic, …)
				on road sides naturally sculpt by storm water flow S3950: deteriorated road S4500: Road 4 m S4700: Waste bins S5000: water supply infrastructure S5350: Box Culvert …… Towards Sabbah S0: Sidewalks (left) S575: Sidewalks on right (10.5 m to 2 m), infrastructure wastewater on right S750: Water Infrastructure on left S900: Tallit Sabbah	

Road Code	CAZA	Name	Natural Environment (Trees, land use, surface water …)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals, …)	Socio-Economic (Shops, Residential areas, traffic, …)
Road 1c	Jezzine	Jezzine Kfarhouna Road/Ain Majdlein Road intersection towards Ain Majdlein	S0: Green areas from either road sides (shrubs and pine trees), areas rich in gravels, pine trees S300: different trees and shrubs on the left, valley on the right S650: Pine trees and Cypress S900: Oak on either road sides, some shrubs and a valley to the right S1300: Fruit orchards on either road sides S1600: Rocky areas on the right side of the road, Brutia pine S1800: Pine trees and green areas S1900: Green areas, shrubs and Callicotome S2000: Brutia Pine S2400: fruit orchards on the left S2525: Different shrubs and oak trees S2900: Fruit orchard	S0: Water channel on the left, insufficient lightening, few cracks above infrastructure S300: New asphalt, water channel continues on the left, waste bins S650: Infrastructure on the left S1300: Rocky walls and metal fences S1400: Road depressions and cracks S1800: Waste bins S2150: wastewater infrastructure, waste bins, handmade rocky fences S2200: handmade rocky fences on either road sides S2775-S2825: High retaining wall of 4 m S2900: rocky and metal fences around the orchards S3000: Concrete wall fence and a retaining wall on the left (200m; 4m) S3100: retaining wall without any protection on the right (5 to 6 m high) S3250: retaining wall + guard rail	S300: excavation activities and machinery on right S650: Residential villa S1800: Few residential buildings S2000: Few residential buildings S2200: Residential buildings S2400: Residential buildings, waste bins S2725: cemetery S3100: residential area S3200: Church on right Farid Serhal Museum at 200 m away from this road Ain Majdlein Public School located at around 80 m from this road and 200 m south the church located at Station 3200

ANNEX 2: CODE OF CONDUCT

1. Background

The purpose of these *CoCs 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 CoCs 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 CoCs 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 ofGBV; children of CAE.

- **Perpetrator-** is defined as the person(s) who commit(s) or threaten(s) to commit an act or acts of GBVorCAE.

- **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 kilometers 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 defense.

- **Contractor** – is defined as any fim1, 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 fonns 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 c01mnit GBV or CAE will be pursued.
2. Treat women and children (persons under the age of 1·8) with respect regardless of race, color, language, religion, political or other opinion, national, etlmic 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 concems or suspicions regarding acts of GBV or CAE by a fellow worker, whether in the same contracting finn 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.
l 0. 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:

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 non-monetary) to community members in exchange for sex – such sexual activity is considered "non-consensual" 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.

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. Mangers 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
Jezzine Caza

Location: Union of Jezzine Municipalities
Date & Time: 03/01/2020 from 10:00 am to 12:00 am
Attendees: 27 attendees (List below)

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, EIA process, World Bank requirements, and listed the potential environmental issues associated with construction and operation of the project.

3. Discussion

There were 27 attendees during the hearing session. The floor was then opened for discussion and questions. The main issues that were raised are as follows:

- One of the participants asked how will the local community benefit from the proposed project during the rehabilitation phase. Specifically, he asked if CDR would assign contractors from the local community or not. CDR responded by noting that CDR has a list of certified contractors and for this project the contractor must be within this list.
- Questions were raised regarding the origin of the raw material that will be used during the rehabilitation phase. Participants were requesting to purchase the raw material from the local community. CDR responded that if the required raw material is available with the required specifications, the contractor will definitely purchase it from the local, as he will save more.
- One of the participants raised questions on the timing and budget of the proposed roads in Jezzine caza, which were responded to by the consultant and CDR.
- More that one participant were asking about the criteria that were taken into consideration when selecting the roads. The consultant and CDR responded to this comment by noting that a study was done for the selection of roads taking into account the current conditions of the roads and budget issue. As such, based on this study the current group of roads was selected in Jezzine Caza.
- The head of union of Jezzine municipalities noted that in the future other roads will be rehabilitated in the caza from other sources of funds (EIB, JICA, …)
- It was requested to coordinate with the municipalities before starting the road rehabilitation work not to double the excavation work if the municipality is planning to do any infrastructure project (sewerage networks, electricity cables, etc.…). The head of the union responded to this

by noting that a meeting will be held in order to identify all the planned infrastructure projects and determine whether these projects interfere with the rehabilitation of the proposed roads or not. The head of the union ensured that if any infrastructure project interferes with the rehabilitation of the proposed roads, no rehabilitation work will be done before finishing the infrastructure work.

- One of the participants requested to plant some trees along the roads and construct retaining walls. This proposal was taken into consideration as a mitigation measure.
- One of the women mentioned that at one of the proposed roads the retaining wall is in poor conditions. She was asking if this project will cover the rehabilitation of this wall. CDR and the consultant responded by ensuring that this will be covered under the proposed project.
- In general, the public supports this project and do not see any major environmental, health and safety concerns.

4. Women's Session

Following the main discussion, a separate session was held with the female participants (4 women). 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:

- None of the women voiced out any concerns related to restriction of movement during the rehabilitation works due to the potential influx of workers to the area. However, the women felt that it is important to hire local workers in such projects. The consultant said that they will raise this issue to the contractor.
- All women agreed on the fact that the project will affect the cleanliness of their houses during the rehabilitation phase especially if the proposed road passes near residential areas. However, they said that they will be patient during this phase since the end result will be a safer road to pass on. In any case, the contractor should inform residents of the timing of construction works in order to minimize this impact. This measure has already been included in the ESMP.
- All women felt that it is important to install warning signs during the rehabilitation phase to inform the commuters about road closure or rerouting directions. They also ensured that flash lights must be installed at the project site at night. The consultant said this will be to taken into consideration and will ensure that the contractor will implement all safety measures that were proposed in the design
- They believe that during operation, the project will contribute positively to improving the economy in a direct and indirect way..

Local and International NGOs were invited to the public consultation. Local NGOs that are specific to Jezzine Caza were the Environmental Protection Society in Jabal Al-Rayhan, Green Future Society, Social Cultural Association, The Cultural Council of Jezzine District, Lebanese Association for Rural Development and SOS. Their mission is to address different concerns and issues among the local society including social, economic, gender equality, environment, poverty, women empowerment, etc. However, two NGOs that were not invited attended the session. These are Caritas-Jezzine and Mar Maroun Association. Those local NGOs may serve as advocates to reduce projects' social and environmental risks and promote good practice. During the hearing they believed that this project can have a positive impact if the associated risks, during both the rehabilitation and mitigation operation phases, are minimized and good practices are put in place. As for the International NGOs, these 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 such as ANERA and ACTED 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.

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


اتحاد بلديات منطقة جزين


5. ماذا يتضمن المشروع خلال مرحلة التنفيذ


LOT 3- South Area
عازور - تعبد - حرف - بتدين اللقش
Google Earth

List of Attendees

جلسة مشاركة عامة - الحضور

PUBLIC HEARING - ATTENDANCE SHEET

مشروع الطرق والعمالة في لبنان

3.1 - Jezzine

Date: 3-Jan-20

الامضاء Signature	الهاتف Telephone	الصفة Position	البلدة Town	المؤسسة Institution	الاسم Name	
[signature]	03-929296	Senior Environmental Consultant	Beirut	ACE / Ecocentra	سنية النقيب	1
[signature]	03-208215	Project Coordinator		ACE	علي الحر	2
[signature]	03-228981	Engineer		CBR	روان عطية	3
[signature]	71-76 56 28	Engineer		ACE	فراس الخوري	4
[signature]	03-760350	مديرة مركز جزين	جزين	وزارة الشؤون الاجتماعية	كلوديت أسعد	5
[signature]	03-459489	نائب رئيس	/	بلدية جزين عين مجدولي	سامر عون	6
[signature]	76/318413	كاتب		بلدية بتدين اللقش	غنا عبيد	7
[signature]	03-489411	مأمور	جزين	قائمقامية قضاء جزين	وليد [illegible]	8
[signature]	07/780420	ناظرة	بكاسين	ابتدائية جزين	ايلي ناصيف	9
[signature]	03-378619	[illegible]	عازور	بلدية عازور	جورج طانوس	10
[signature]	70296997	Formane	عازور	عازور	كلود [illegible]	11
[signature]	03032328	مسؤول	جزين	Phoenix	ايلي كرماني	12
[signature]	03 488483	كاهن	جزين	رعية مار مارون جزين	الخوري [illegible]	13
[signature]	03/332416	مختار	جزين	مختار جزين	المختار يوسف حبيب الله	14
[signature]	03/228550	محامي	جزين	كاريتاس جزين	أنطوان [illegible]	15
[signature]	03.204378/07.803037	متقاعد	قيتولي	جمعية مار منصور	جوزف عون	16
[signature]	٧٦/٨١٨٣٤٤	مهندس متقاعد	جزين	جمعية مار [illegible]	بيار مارون [illegible]	17
			جزين	مختار جزين	المختار روبير قرداحي	18
					[illegible]	19
[signature]	٧٧١١٦٩٦١	مختار		مختار عين مجدليا	[illegible] الياس	20
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[signature]	76/358786	مختار		مختار [illegible]	طوني بو سليمان	22

جلسة مشاركة عامة - الحضور

PUBLIC HEARING - ATTENDANCE SHEET

مشروع الطرق والعمالة في لبنان

3.1 - Jezzine

Date: 3-Jan-20

الامضاء Signature	الهاتف Telephone	الصفة Position	البلدة Town	المؤسسة Institution	الاسم Name	
[signature]	03/570369	مدير	جزين	مدرسة جزين المتوسطة الرسمية	شربل وديع قرداحي	1
[signature]	03/891132	مختار	عازور	مختار بلدة عازور	انطوان جرجس رزق	2
[signature]	03/777947	رئيس بلدية	عازور	رئيس بلدية عازور	[illegible] عازوري	3
			[illegible]	[illegible]	جليل [illegible]	4
[signature]	70/504129	معاون [illegible]	[illegible]	اتحاد بلديات [illegible]	غسان سلوم	5
						6
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Presentation during Public Hearing


مشروع الطرق والعمالة
في لبنان

THE WORLD BANK

خطة الإدارة البيئية والاجتماعية

LOT 3
3.1 - قضاء جزين

جلسة مشاركة العامة

ACE


نقاط حوار الجلسة

- مقدمة
- أهداف اللقاء
- الجهات المعنية بالمشروع
- مراحل اعداد الخطّة البيئية والاجتماعية
- وصف المشروع وأبرز مكوناته
- الآثار البيئية والاجتماعية الايجابية المحتملة للمشروع
- الآثار البيئية والاجتماعية السلبية المحتملة للمشروع
- أسئلة ومناقشة عامة


مقدمة

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


مقدمة

- تتمتع شبكة الطرق في لبنان بنطاق وكثافة 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


2. الجهات المعنية بالمشروع

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


1. أهداف اللقاء

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

3. مراحل إعداد الخطة البيئية والإجتماعية

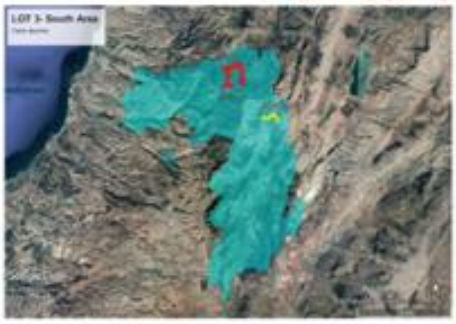
4. وصف المشروع

4.1 الطرق التي سيتم إعادة تأهيلها في قضاء جزين

- طريق جزين كفرحونة / طريق عين مجدلين باتجاه عين مجدلين (Road 1c)
- عازور - تعيد - حرف - بتدين اللقش - حتى طريق صيدا جزين (Road 1a)

مجموع طول الطرق المذكورة أعلاه: 15.5 كيلومتر

4.2 موقع المشروع في قضاء جزين



4.3 الطرق المقترح تأهيلها في قضاء جزين

4.4 صور لعدة مواقع ضمن المشروع في قضاء جزين

Road 1a – Sta 0+610

4.4 صور لعدة مواقع ضمن المشروع في قضاء جزين

Road 1a – Sta 2+825

4.4 صور لعدة مواقع ضمن المشروع في قضاء جزين

Road 1a – Sta 3+645

4.4 صور لعدة مواقع ضمن المشروع في قضاء جزين

Road 1a – Sta 2+270

4.4 صور لعدة مواقع ضمن المشروع في قضاء جزين

Road 1c – Sta 1+455

4.4 صور لعدة مواقع ضمن المشروع في قضاء جزين

Road 1c – 2+725

5. ماذا يتضمن المشروع خلال مرحلة التنفيذ؟

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

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

5. ماذا يتضمن المشروع خلال مرحلة التنفيذ؟

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

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

7. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التنفيذ

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

6. الآثار البيئية والاجتماعية الإيجابية للمشروع

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

7. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التنفيذ

النشاط	الأثر المحتمل
حركة الآليات والمركبات	زيادة احتمال حوادث السير
انبعاثات الغبار وزيادة نسبة الضجيج	ضرر على السلامة العامة وسلامة العمال
التدابير التخفيفية	
• إدارة حركة المرور أثناء تنفيذ المشروع وتعيين موظف لهذه الغاية	
• التأكد من أن الإشارات التحذيرية وأنظمة الإضاءة ظاهرة وموجودة في الأماكن المكتظة وخاصة قرب المدارس والمستشفيات والمناطق التجارية	
• حصر أعمال التنفيذ خلال فترة النهار	

8. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التشغيل

النشاط	الأثر المحتمل
زيادة حركة المرور	زيادة احتمال حوادث السير
زيادة حركة النقل على الطرق	زيادة انبعاث ملوثات الهواء والضجيج والازدحامات
زيادة الانسكابات والتسربات الناتجة عن المركبات المتنقلة	تلوث التربة والمياه
التدابير التخفيفية	
• الصيانة الدورية للطرق	
• صيانة البنية التحتية مع تفادي تأثيرها على الطرق	
• تقليل حركة مرور الشاحنات الثقيلة بهدف المحافظة على الطريق	


شكـــــراً لحضوركم
ومشاركتكم


أسئلة ومناقشة عامة
يمكنكم إبداء رأيكم:
عبر التواصل مع
المكتب الهندسي الإستشاري
هاتف: 01/497250
فاكس: 01/497550
بريد الكتروني: ace@ace-intl.com
أو
عبر التواصل مع
وحدة مشروع الطرق والعمالة
في مجلس الانماء والاعمار
هاتف: Ext. 317 01/980096
بريد الكتروني: rstephan@cdr.gov.lb

ANNEX 4: GRIEVANCE REDRESS MECHANISM (GRM) FORM

Reference No:	
Contact Information (Name should be optional for allowing for anonymity) **Please mark how you wish to be contacted (mail, telephone, e-mail).**	☐ **By Post: Please provide mailing address:** _____ _____ _____ ☐ **By Telephone:** _____ ☐ **By E-mail** _____
Preferred Language for communication	☐ **Arabic** ☐ **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	
	☐ **One time incident/grievance (date _____)** ☐ **Happened more than once (how many times? _____)** ☐ **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