ROADS &
EMPLOYMENT PROJECT

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION

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

LOT 4

AKKAR - MINIEH & DANNIYEH - ZGHARTA

APPENDIX B1

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

MARCH 2020

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Final

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LIST OF ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACE	Associate Consulting Engineers
BOQs	Bill of Quantities
CBD	Convention on Biological Diversity
CDR	Council of Development and Reconstruction
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CO	Carbon Monoxide
COM	Council of Ministers
EA	Environmental Assessment
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plans
GBV	Gender Based Violence
GRM	Grievance Redress Mechanism
IBA	Important Bird Area
IFC	International Finance Corporation
LARI	Lebanese Agriculture Research Institute
MOC	Ministry of Culture
MOE	Ministry of Environment
MOIM	Ministry of Interior and Municipalities
MOL	Ministry of Labor
MOPWT	Ministry of Public Works and Transportation
NAAQS	National Ambient Air Quality Standards
NGOs	Nongovernmental Organizations
NO	Nitrogen Monoxide
NOx	Nitrogen Oxides
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
REP	Road and Employment project
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
VAC	Violence Against Children
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization

EXECUTIVE SUMMARY – NON-TECHNICAL SUMMARY

ES1. Introduction

The Council for Development and Reconstruction (CDR) acting as an executing agency on behalf of the Lebanese Council of Ministers (COM) assigned Associated Consulting Engineers (ACE), hereinafter the Consultant, to prepare the assessment, design and Environmental and Social Management Plans (ESMP) of Lot 4 under Roads and Employment Project. 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 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 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 various laws and regulations that road projects must abide by:

- Labor Law/1946: The Lebanese Labor Code
- law No. 335/2001: Pursuant to the International Labor Organization ILO Convention No 128
- law No. 400/2002: Pursuant to ILO Convention No 138
- Decree 8987/2012 Prohibition of employment of minors under the age of 18 in work that may harm their health, safety or morals
- Decree 3791/2016 Minimum Wage
- Decree 2761/1933 on The prohibition of wastewater discharge into water streams
- Decree 8735/1974 on the Conservation of Public Hygiene
- Law 64/1988: Protection of the environment against pollution from hazardous waste disposal and substances
- Law 558/1996: Protection of forests
- MOE Decision 52/1 (1996) and 8/1 (2001) on the Requirements to protect air, water, and soil pollution

- Law 64/1988 Protection of the environment against pollution from hazardous waste disposal and substances
- MOE Decision 8/1/2001 Revised standards for air emissions, liquid effluents and wastewater treatment plants
- Law 444/2002 Framework Law for Environmental Protection
- Law 77/2018: Water Law
- Law 78/2018: Air Quality Law
- Law 80/2018: Integrated Solid Waste Management
- Decree 11802/2008 Occupational prevention, safety, and health in all enterprises subject to the Code of Labor
- Decree-Law 118/1977 on the Municipal Act
- Law 37/2008 on the Cultural Policy Law
- Law243/2012: New Traffic Law
- Decree 340/1943: Penal Code (Legislative Decree No. 340)
- Law 58/1991: Expropriation law
- Law 53/2017: Amendment of Penal Code
-

The World Bank Policies and Procedures: OP/BP 4.01on Environmental Assessment, classifies the proposed project under Category 'B'. In addition, according to the ESMF report, this project was categorized under Category B project. OP/BP 4.12 on Involuntary Resettlement. However, the project will avoid or minimize land acquisition and resettlement to the extent possible. In addition to the Public consultation and Disclosure Policy under OP/BP 4.01.

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

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), and Convention on Biological Diversity (CBD).

ES3. Description of the Proposed Project

The study area where the proposed roads are located is in the Caza of Zgharta of North Lebanon Governorate. The total number of the proposed roads to be rehabilitated under this project is 4 roads with a total length of 19.20 km. The proposed roads are listed below:

- L4-ZG-RD1A-1: Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta
- L4-ZG-RD1A-2: Asnoun – Ain Qroumbech – Zgharta El Zewieh
- L4-ZG-RD1A-3: Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh
- L4-ZG-RD1D: Bchinnine – Kfarchakhna – Kfar Zeina

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 rehabilitation activities differ for each road depending on the pavement conditions and the road rating that was defined by the consultant.

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

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

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

ES4. Baseline Environmental and Social Conditions

Topography, Geology and Hydrogeology

The proposed roads are located, in Zgharta and lie within a range of 62 m to 240 m above sea level. The main geological formation within the study area belongs to the following: Pleistocene (q), Miocene - marly conglomerates and reef limestones (m2), Marl of Neogene (mL), and Pliocene (P). As for the water sources that are located within the project area, one river (Rachiine River) and two streams were identified within the study area.

Climate and Meteorology

The average annual temperature in Zgharta is 19.4 °C. The most rain events in the Caza of Zgharta fall in the winter during the month of January with an average of 190 mm. Additional data on climate in the area was obtained from the Lebanese Agriculture Research Institute (LARI) from its station in the village of Kfar Chakhna that is part of the project and located on road L4-ZG-RD1D.

Air Quality and Noise

data obtained from the UNDP project "Air quality assessment in an East Mediterranean country: the case of Lebanon"showed that the concentrations of NO2 comply with the national standards while two cells[1] representing a section from Road L4-ZG-RD1A-1 are not

[1] As part of the project Environmental Resources Monitoring in Lebanon, air quality data was obtained from five stations located in North Lebanon, South Lebanon, Beirut (2 stations), and in Bekaa in 2012. The country was divided into cells by modelling the air emission results from these stations.

in compliance with WHO standards. PM2.5 and PM10 concentrations were not in compliance with the WHO standards for air quality except the obtained concentrations in cells 6 and 8 that were below the standard for PM10. As for the level of noise in the region, as no data was available on the project location, observations during site visits showed that noise levels were not significant along most of the roadshowever slightly high around other populated areas.

Land Use/Land Cover

During the site visits, it was observed that natural terrains with little vegetation dominated the majority of the roads nearby areas. The table below represents the visual classification of the land use of the villages where the REP passes in Zgharta Caza is listed below:.

Municipality	Land Use
Mejdlaya	Sparsely populated with dense agricultural areas
Ardate	Densely populated with agriculture areas
Zgharta	Densely populated
Kfar hata	Sparsely populated with agriculture areas
Asnoune	Sparsely populated with dense agriculture areas
Karabeiche	Moderately populated with agriculture areas
Kfar Dalakoss	Densely populated with agriculture areas
Rachehine	Moderately populated with agriculture areas
Bchenine	Sparsely populated with dense agriculture areas
Kfar Chakna	Dense agriculture areas
Kfar Zeina	Moderately populated with agriculture areas

Biological Environment and Ecologically Sensitive Areas

Flora: Different fields of olive and orange trees have dominated along the roads L4-ZG-RD1A-2 and L4-ZG-RD1A-3 and some fig trees and Cypress trees were observed on these roads respectively. As for Road L4-ZG-RD-1D. Along the road L4-ZG-RD-1D, pine trees and olive trees fields were noticed along this road.

Fauna: During the site visits, wild animals including mammals and birds were not observed. Livestock (sheep and goats) were noticed in some farms along some of the roads such as in the cow farms on the road L4- ZG-RD1A-2.

None of the studied roads in this project are located near or in an Important Bird Area (IBA). The road nearest road (ZG-RD-1D) is about 10 km away from the IBA and Horsh Ehden Nature Reserve.

Demographic Profile

The total population registered in the Zgharta District including refugees is 115,053 inhabitants. The total number of registered Syrian refugees was 17,000 individuals in Zgharta Caza in 2019. During site visits no informal refugee settlements were observed near project roads. The unemployment rate in the caza of Zgharta is estimated at 14.1 % compared to the national average of 11.4 %.

Economic Activities

Many shops, gas stations, pharmacies and car repairing were identified along the proposed roads during the site visit. Along road L4-ZG-RD1A-1 there are many shops, two pharmacies, two hospitals, six gas stations, a car repairing shop and a school. As for L4-ZG-RD1A-2, the area is urbanized with many small shops and an industrial hangar. L4-ZG-RD1A-3 also has minimarkets, furnisher shops and an olive press. Along L4-ZG-RD1D there are shops and an industry for concrete blocks manufacturing.

Education

Zgharta - Ehden account 11 schools, 7 public school and 4 private schools. During the site visits only one school was identified along the road L4-ZG-RD1A-1.

Health Services

The caza of Zgharta includes five hospitals, of which four are private hospitals and one is public. Two hospitals were within the study area and are Al Rahban Hospital and Hospital Saydet Zgharta. These hospitals are located at around 160 meters and 300 meters away from the road L4-ZG-RD1A-1 respectively.

Cultural Heritage

During the site visits, sites of archaeological or cultural importance were not identified along the project roads. Moreover, none of the proposed roads lead to any archeological site.

Sensitive Areas

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

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

Summary of Impacts and Mitigation during Rehabilitation Phase

Impact	Mitigation Measures
Environmental	
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 construction and excavation activities	
Noise pollution a result of transportation or delivery of raw materials, trucks movement, concrete mixing, drilling, construction and operation of heavy vehicle movement such as excavators	Maintenance of vehicles and machinery Excavation and any other noisy activity only during working hours Prohibit solid waste disposal into nearby areas
Contamination of surface water from improper disposal of wastewater from workers and of water coming from cleaning of machines and equipment Reduction in overall surface water quality due to improper disposal of construction waste Water pollution due to accidental spill of oils and chemicals	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

Impact	Mitigation Measures
Contamination of soil from accidental spills of oils and chemicals on the soil from machines and trucks and from transportation of chemicals and oils	Proper disposal of construction waste Proper waste management practices Reuse or recycle the generated waste whenever possible Reuse of excavated material whenever possible Disposal of excavated material in controlled disposal sites Train workers on waste reduction procedures
Improper disposal of cut volume may cause contamination of water bodies in rainy weather	Reuse of excavated material whenever possible Disposal of excavated material in controlled disposal sites
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	Proper disposal of construction waste Proper waste management practices Reuse or recycle the generated waste whenever possible Reuse of excavated material whenever possible Disposal of excavated material in licensed sites 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
Over extraction of borrowing material and depletion of natural resources (sand, aggregates, …)	Ensure that the borrow material are extracted from legal sites Avoid agricultural lands to extract borrowing material In case extraction was done from agricultural sites, store the top soil layer for future rehabilitation Rehabilitate the site where excavation was done
Material falling from vehicles during transport may cause traffic accidents or congestion Accident and injuries to workers because of construction activities (mainly respiratory health risks) Dust generation and noise may cause health related problems to nearby residents	Ensure traffic is not blocked during transportation Inform residents and place signs near the working areas Cover transported material Abide by traffic regulations Operate well maintained vehicles
Injuries from car accidents due to the presence of construction sites and closure of some roads	Traffic shall be secured via alternative routes to reach relevant destinations in case the works imply the temporary closure of this road Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage GRM for surrounding communities
Socioeconomic	
Creation of job opportunities for local communities	Priority hiring to qualified local community Daily registrations of workers and verification of their age to prevent child labor GRM for local communities Ensure a fair allocation of job opportunities and equal contractual wages/benefits and working conditions for workers
Discrimination from the local community against the foreign workers	Conduct awareness campaigns for the local community and workers regarding foreign workers influx Inform the local community that worker will sign code of conduct before stating the work GRM for local communities and all relevant stakeholders
Social tensions as a result of perception that foreign workers being offered a major proportion of the jobs created by the project	Draft Codes of Conduct and the guidelines for a GBV and VAC Action Plan All workers should sign codes of conduct written in their

Impact	Mitigation Measures
	native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority Training on gender-based aspects, internal and external GRM
Child labor for construction activities	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
Traffic congestion in the concerned towns due to transport of construction materials, the material that may fall or due to temporal road closure	Ensure traffic is not blocked during transportation Inform residents and place signs near the working areas Cover transported material Abide by traffic regulations Operate well maintained vehicles
Potential occurrence of sexual abuse and exploitation incidents induced by labor influx	Draft Codes of Conduct and the guidelines for a GBV and VAC Action Plan All workers should sign codes of conduct written in their native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority Training on gender-based aspects, internal and external GRM
Disruption of local community to access services due to construction activities and temporary road closure	Traffic shall be secured via alternative routes to reach relevant destinations in case the works imply the temporary closure of this road Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage GRM for surrounding communities
Disruption to access to shops as a result of construction activities and temporal road closure thus affecting livelihood of shop's owners	Install temporarily structures (wooden boards) from the road to the shops, the recreational site entrance, the medical center, school and Mosques Proper installation of sign boards Timely completion of the rehabilitation phase
Community and Occupational Health and Safety	
Accident and injuries to workers because of construction activities (mainly respiratory health risks)	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
Dust generation and noise may cause health related problems to nearby residents	

Summary of Impacts and Mitigation during Operation Phase

Impact	Mitigation Measures
Environmental	
Increased vehicular pollutant levels 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

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 s eco-friendly light fixtures for the street light infrastructure to reduce the consumption of non-renewable sources of energy
Disruption of animals movement leading to direct mortality or avoidance behaviour as a result of increased traffic load in the area	Install speed limit and animal crossing signs at areas were animals cross the roads
Possible oil spill events transported through runoff and polluting nearby surface and groundwater bodies	Ensure that the road is regularly maintained to ensure good surface conditions
Accident occurrence due to the enhancement of vehicular movement resulted from the improvement of road conditions	
Community and Occupational 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 Municipality of Zgharta on Saturday, 12 October 2019. The purpose of the hearing was to inform the stakeholders and the local NGOs about the proposed project to rehabilitate 4 roads in Zgharta Caza and their accompanying infrastructural works and to take into account their concerns and feedback. After inviting many stakeholders and NGOs and contacting them several times to ensure they are aware of the hearing and its objectives, a total of 14 people participated in the meeting including 4 women in their forties to fifties; one woman the director of a public school, another an agriculture engineer and the director of the Ehden Nature Reserve and another women is a director of a NGO mainly a cultural women organization. The men are mainly municipality mayors, vice presidents and one working in an engineering office. During the session, different concerns were raised by the attendees especially those concerning road selection and road safety issue. The public proposed to install sidewalks in that area to ensure public safety.

The women participants were interviewed in a separate session in order to raise their concerns too. They stated that the project will contribute positively to improving women's participation in the economy by making transportation safer and more convenient. However, they mentioned must be a clear coordination mechanism with the municipalities and other authorities during the rehabilitation phase to quickly address potential problems such as burst water or wastewater pipe. They also believe that the period of the rehabilitation phase must be implemented during summer where there are no schools and most of the residents are in Ehden. These proposed measures by the public will be taken into consideration and the project design that includes the rehabilitation of the roads and its different components including the sidewalks was proposed by the public.

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. Their mission is to address different concerns and issues among the local society including social, economic, gender equality, environment, poverty, women empowerment, etc. and (2) the international level, : they cover the whole country and their consultation will be applied to all the ESMPs of the REP. When the crisis in Syria erupted in early 2011, numerous International NGOs responded to the humanitarian crisis and worked directly with the Syrians in Lebanon by providing aid and responding to their critical situation.

In addition, a formal grievance readiness mechanism (GRM) will be 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). Furthermore, the grievance mechanism is applicable for communities and for workers (both Lebanese and Syrian workers) with the option to remain anonymous when filing a grievance to encourage workers to speak out without potential fear of repercussions.

ES7. Conclusion

It was concluded that most of the negative impacts will occur during the rehabilitation phase. These impacts are mainly related to the disruption of nearby residents from the rehabilitation activities along with some impacts on the surrounding environment such as deterioration of soil and water quality if the generated liquid waste and solid waste were not managed properly. In addition to the negative impact on the air quality that might arise as a result of heavy rehabilitation activities especially where new pavement is proposed for the roads. On the other hand, job opportunities will be created to the local community during the rehabilitation phase which is considered as a positive impact. However, these impacts are short in term and will diminish as soon as the project is completed. The assessed socioeconomic impacts during the operational phase were mostly positive in nature in terms of traffic and road safety and livelihood improvement within the project area. However, on the long term the proposed project will contribute in increasing vehicular pollutant levels in the area as well as traffic related noise causing public health problems and other impacts on the environment. Nevertheless, the negative environmental and social impacts that might arise from the rehabilitation of the proposed roads in Zgharta 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)، المستشار، لإعداد خطة إدارة بيئية واجتماعية لـ"Lot 4" 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 زغرتا، 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 التقرير 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 الثقافة.
القوانين واللوائح المختلفة التي يجب ان تتقيد بها مشروعات الطرق:

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

- مرسوم ٢٠٠٤/١١٨٠٢: تنظيم الوقاية والسلامة والصحة المهنية في كافة المؤسسات الخاضعة لقانون العمل
- المرسوم الاشتراعي رقم١٩٧٧/١١٨ قانون البلديات
- قانون ٢٠٠٨/٣٧: قانون الممتلكات الثقافية
- قانون ٢٠١٢/٢٤٣: قانون السير الجديد
- المرسوم التشريعي ١٩٤٣/٣٤٠: قانون العقوبات
- قانون ١٩٩١/٥٨: قانون الاستملاك
- قانون ٢٠١٧/٥٣: الغاء المادة ٥٢٢ وتعديل بعض مواد قانون العقوبات

سياسات 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.

وفقا للسياسة التنفيذية رقم٤,٠١ يشترط البنك الدولي إجراء أجتماع حلقه تشاوريه ومع العديد من المهتمين والمعنين بالمشروع والمنظمات غير الحكومية المحلية بشأن جميع المشاريع التي تندرج في الفئة A والفئة B. والهدف من هذه المشاورات هو عرض عناصر المشروع إلى جانب الآثار البيئية والإجتماعية التي يمكن ان تنتج، وأخذ كل تساؤلات و ملاحظات الموجودين بالأعتبار.

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

وصف المشروع المقترح

يقع المشروع المقترح في قضاء زغرتا، محافظة الشمال. يبلغ مجموع الطرق المقترحة والتي سيتم تأهيلها في إطار هذا المشروع أربعة ويبلغ طولهما الإجمالي ١٩,٢٠ كيلومترا. الطرق المقترحة مدرجة أدناه:

- L4-ZG-RD1A-1: مجدليا - عردات – زغرتا- أصنون- كفر حتا
- L4-ZG-RD1A-2: أصنون -عين قره باش- زغرتا الزاوية
- L4-ZG-RD1A-3: زغرتا - كفردلاقوس حتى تقاطع دير نبوح
- L4-ZG-RD1D: بشنين - كفرشخنا - كفر زينة

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.

يتضمن المشروع المقترح تأهيل طرق موجودة سابقا في قضاء زغرتا. 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

الوضع البيئي والاجتماعي الحالي

التضاريس والجيولوجيا والهيدروجيولوجيا

يقع قضاء زغرتا، حيث الطرق المقترحة ضمن مدى ٦٢ مترا و ٢٤٠ مترا فوق سطح البحر. ينتمي التكوين الجيولوجي الرئيسي داخل منطقة الدراسة إلى ما يلي: Pleistocene (q), Miocene - marly conglomerates and reef limestones (m2), Marl of Neogene (mL), and Pliocene (P) أما بالنسبة لمصادر المياه الموجودة داخل منطقة المشروع، فقد تم تحديد نهر واحد (نهر رشعين) ومجرى في محيط منطقة الدراسة لكنه لم يتم تحديد أي ينابيع داخل المنطقة الدراسية

المناخ والأرصاد الجوية

يبلغ متوسط درجة الحرارة السنوية في زغرتا ١٩.٤ درجة مئوية. وتسقط معظم الأمطار في قضاء زغرتا في الشتاء خلال شهر كانون الثاني/يناير بمعدل ١٩٠ ملم (mm). وتم الحصول على معلومات إضافية عن المناخ في المنطقة من محطة مصلحة الأبحاث العلمية الزراعية من قرية كفرشخناالتي هي جزء من المشروع وتقع على طريقL4-ZG-RD1D وتمثل هذه البيانات متوسط درجات الحرارة ومعدل الهطول في عام ٢٠١٨، بالاضافة الى المتوسطات الشهرية والسنوية لسرعة واتجاهات الرياح.

جودة الهواء والضوضاء

لقد اخذت البيانات المتعلقة بجودة الهواء المحيطة بمنطقة المشروع من وزارة البيئة من خلال مشروع برنامج الأمم المتحدة الإنمائي. وقد أظهرت النتائج أن تركيزات ثاني أكسيد الكربون(NO2) في جميع الخلايا متوافق مع المعايير الوطنية بإستثناء التركيزات التي تم الحصول عليها لخليتين تمثلان قسم من الطريق-L4-ZG RD1A-1حيث ان القيم التي تم الحصول عليها غير متوافقة مع معايير منظمة الصحة العالمية الخاصة بنوعية الهواء و التي تعتبر أكثر صرامة من المعايير الوطنية. اما فيما يتعلق بتركيزات PM2.5 و PM10، لم تكن القيم التي تم الحصول عليها متوافقة مع معايير منظمة الصحة العالمية الخاصة بنوعية الهواء بإستثناء التركيزات التي تم الحصول عليها في الخلاية رقم ٦و و٨ والتي كانت دون مستوى معايير PM10. وفيما يتعلق بمستوى الضوضاء في المنطقة، ونظرا لعدم توافر عن موقع المشروع، أظهرت الملاحظات التي أبديت خلال الزيارات الميدانية أن مستوى الضوضاء قد لوحظ أنه أعلى في المناطق المأهلة و المكتظة بالسكان.

غطاء الأرض

لوحظ خلال زيارات الموقع أن التضاريس الطبيعية ذات الغطاء النباتي القليل تهيمن على معظم المناطق القريبة من الطرق. يمثل الجدول التالي التصنيف البصري لغطاء الأراضي التي تمر فيها الطرق في قضاء زغرتا.

البلدية	غطاء الأرض
مجدليّا (زغرتا)	ذات كثافة سكانية منخفضة - وجود أراضي زراعية كثيفة
عردات	ذات كثافة سكانية مرتفعة - وجود أراضي زراعية
زغرتا	مكتظة بالسكان
كفر حتّا	ذات كثافة سكانية منخفضة–وجود أراضي زراعية
أصنون	ذات كثافة سكانية منخفضة - وجود أراضي زراعية كثيفة
قره باش	ذات كثافة سكانية متوسطة – وجود اراضي زراعية

البلدية	غطاء الأرض
كفر دلاقوس	ذات كثافة سكانية مرتفعة – وجود اراضي زراعية
رشعين	ذات كثافة سكانية متوسطة – وجود اراضي زراعية
بشنين	ذات كثافة سكانية منخفضة - وجود أراضي زراعية كثيفة
كفار شخنا	وجود أراضي زراعية كثيفة
كفر زينا	ذات كثافة سكانية متوسطة – وجود اراضي زراعية

البيئة البيولوجية والمناطق الحساسة إيكولوجيا

النباتات: المناطق الزراعية تزرع فيها بشكل مكثف حقول الزيتون والحمضيات وأشجار الفواكه مثل التين والبرتقال. وتشمل المناطق الطبيعية بصورة رئيسية الغابات الكثيفة مثل الشوح والبلوط والصنوبر وغابات اخرى و والأراضي العشبية. وقد هيمنت حقول أشجار الزيتون والبرتقال على طول الطرق L4-ZG-RD1A-2و L4-ZG-RD1A-3 ، وحددت بعض أشجار التين والسرو على هذه الطرق على التوالي. اما على طول الطريقL4-ZG-RD-1D ، لوحظ وجود حقول أشجار الصنوبر و الزيتون على طول جوانب هذه الطريق.

الحيوانات: لم يتم التعرف على الحيوانات البرية بما فيها الثدييات والطيور خلال زيارة الموقع. وعلاوة على ذلك، لوحظ وجود مواشي (غنم وماعز) في بعض المزارع على طول بعض الطرق مثل مزارع البقر على الطريق .L4- ZG-RD1A-2

يضم قضاء زغرتا محمية حرش اهدن الطبيعية التى أعلنت فى عام ١٩٩٢ محمية طبيعية من قبل وزارة البيئة. واعلنت BirdLife International فى عام ١٩٩٤ كمنطقة للطيور المهمة. لكن الطرق المقطرحة في هذا المشروع لا توجد بالقرب منها.

الديموغرافيا

يبلغ مجموع السكان المسجلين في قضاء زغرتا، بمن فيهم اللاجئون ١١٥,٠٥٣ نسمة، وتبلغ الكثافة السكانية ٥٤٨ نسمة لكل كيلومتر مربع. يبلغ عدد اللاجئين السوريين المسجلين في قضاء زغرتا ١٧ ألف شخص عام ٢٠١٩. وخلال زيارات الموقع لم يلاحظ وجود مستوطنات غير رسمية للاجئين بالقرب من طرق المشروع. ويقدر معدل البطالة في قضاء زغرتا ١٤.١ في المئة مقارنة بالمتوسط الوطني في لبنان ب١١.٤ في المئة

الأنشطة الإقتصادية

يعتمد اقتصاد شمال لبنان على قطاع الخدمات والصناعة والزراعة. ويعمل في قطاع الخدمات حوالي ٣٣ في المائة من القوى العاملة، بما في ذلك التأمين والخدمات المالية. أما في مجال الصناعة والزراعة، فالعمالة موزعة بنسبة ١٤٪ و١١٪ على التوالي. وتم خلال زيارة الموقع تحديد عدد كبير من المحلات ومحطات الوقود والصيدليات ومحلات تصليح السيارات على طول الطريق وهي قريبة من بعض الطرق خاصة في المناطق السكنية. على سبيل المثال، يوجد على طول طريق L4-ZG-RD1A العديد من المتاجر وصيدليتين ومستشفيين وست محطات وقود ومحل لتصليح السيارات ومدرسة. أما بالنسبة إلى L4-ZG-RD1A-2 فهي منطقة سكنية مع العديد من المتاجر الصغيرة.على طول L4-ZG-RD1A-3 هناك العديد من المتاجر الصغيرة محلات الأثاث ومعصرة زيتون. اما على طول L4-ZG-RD1D هناك متاجر ومصنع لتصنيع احجار البناء.

قطاع التعليم

يوجد في قضاء زغرتا ١١ مدرسة منها٧ مدارس حكومية و٤ مدارس خاصة. ٣١٥٩ طالبا مسجلين في مدارس حكومية و١٧٦٤ طالبا مسجلين في المدارس الخاصة. وخلال زيارة الموقع تم تحديد مدرسة واحدة فقط على طول طريقL4-ZG-RD1A-1

قطاع الرعاية الصحية

يضم قضاء زغرتا خمسة مستشفيات منها أربعة مستشفيات خاصة وواحدة حكومية. هناك مستشفيان داخل منطقة الدراسة هما مستشفى الرهبان ومستشفى سيدة زغرتا. تقع هذه المستشفيات على بعد حوالي ١٦٠ مترا و٣٠٠ متر على التوالي من الطريق.L4-ZG-RD1A-1

التراث الثقافي
لم يتم تحديد مواقع ذات أهمية أثرية أو ثقافية على طول الطرقات المقطرحة خلال زيارة الموقع و أيا من الطرق المقترحة لا يؤدي إلى أي موقع أثري.

ملخص الوضع الحالي
خلال زيارة الموقع التي جرت في تشرين الثاني/نوفمبر ٢٠١٨ وكانون الأول/ديسمبر ٢٠١٩، تم تحديد المناطق الحساسة التي قد تتأثر نتيجة المشروع المقترح و هي: مراكز الرعاية الصحية والمراكز التعليمية. وتم تحديد جميع هذه المؤسسات على طول الطرقات المقطرحة ، وقد ورد ذلك بالتفصيل في التقرير.

موجز الآثار البيئية والاجتماعية المحتملة والتدابير التخفيفية خلال مرحلتي التأهيل والتشغيل

ملخص للآثار البيئية والاجتماعية والاقتصادية المحتملة والتدابير التخفيفية خلال مرحلة 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 ري الأرض عندما تكون الرياح شديدة مزج المواد في أمكان مغلقة تغطية المواد عند النقل
تلوث الغبار الناجم عن أنشطة إعادة التأهيل والحفر	
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 حظر التخلص من النفايات الصلبة في المناطق المجاورة
تلوث المياه السطحية من جراء التخلص غير السليم من مياه الصرف الصحي من العمال والمياه القادمة من تنظيف الآلات والمعدات انخفاض في نوعية المياه السطحية الإجمالية بسبب التخلص غير السليم من نفايات البناء تلوث المياه بسبب تسرب عرضي للزيوت والمواد الكيميائية	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 التربة بسبب انسكاب الزيوت والمواد الكيميائية عن طريق الخطأ من الآلات والشاحنات ونقل المواد الكيميائية والزيوت	التخلص السليم من مخلفات البناء 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 تدريب العمال على إجراءات تخفيف النفايات
التخلص غير السليم من كميات الحفر يسبب تلوث المياه في الطقس الممطر	إعادة استخدام المواد المحفورة كلما أمكن ذلك التخلص من المواد المحفورة في المكبات الخاضعة للرقابة
تلوث المياه السطحية والتربة بسبب التخلص غير السليم من النفايات الصلبة الصادرة عن العمال والمواد المستعملة،	التخلص السليم من مخلفات البناء إدارة النفايات بالممارسات المناسبة إعادة استخدام أوإعادة تدوير النفايات الناتجة كلما أمكن ذلك

الآثار	التدابير التخفيفية
ومخلفات البناء الناجمة عن أعمال الحفر	إعادة استخدام المواد المحفورة كلما أمكن ذلك التخلص من المواد المحفورة في المكبات الخاضعة للرقابة 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
إستخراج مواد الخام واستنفاد الموارد الطبيعية (الرمل، البحص، ...)	تأكد من استخراج مواد الخام من المواقع القانونية تجنب الأراضي الزراعية لاستخراج مواد الخام تخزين الطبقة العليا من التربة في حالة إجراء الاستخراج من مواقع زراعية لإعادة تأهيلها في المستقبل إعادة تأهيل الموقع الذي تم فيه التنقيب
تأثر الأشجار والنباتات بالقرب من الموقع أثناء أنشطة إعادة التأهيل	صيانة المركبات والآلات حصرالحفر وأي نشاط ضوضائي خلال ساعات العمل فقط حظر التخلص من النفايات الصلبة في المناطق المجاورة وتجنب ممارسة أي نشاط للمشروع خاصة بالقرب من محمية اللزاب الطبيعية
انزعاج الحيوانات والسكان في المنطقة المجاورة من الضوضاء والنور والغبار	
احتمال ضرر البنية التحتية القائمة	التنسيق مع البلديات
حوادث مرور أو إزدحام نتيجة سقوط مواد من المركبات أثناء النقل	تأكد من عدم حظر حركة المرور أثناء النقل إعلام السكان ووضع لافتات بالقرب من مناطق التأهيل والعمل تغطية المواد المنقولة الالتزام بقواعد المرور تشغيل المركبات التي تتم صيانتها بشكل جيّد
الإصابات الناتجة عن حوادث السيارات بسبب وجود مواقع إعادة التأهيل وإغلاق بعض الطرق	تأمين حركة المرور عبر طرق بديلة للوصول إلى الوجهات ذات الصلة في حال استدعت أعمال التأهيل لإغلاق مؤقت لهذا الطريق إبلاغ المجتمع المحلي عن موقع الطرق المقفلة أو التحويلات من خلال الإعلانات العامة ولافتات التحويل المناسبة آلية مراجعة الشكاوى (GRM) للمجتمعات المحيطة
اقتصادي واجتماعي	
توفير فرص عمل للمجتمعات المحلية	إعطاء أولوية التوظيف الى المجتمع المحلي المؤهل التسجيل اليومي للعمال والتحقق من سنهم لمنع عمل الأطفال آلية مراجعة الشكاوى (GRM)للمجتمعات المحلية
استفادة محلات صيانة الاليات المحلية من صيانة المعدات و الشاحنات، واستفادة السكان من رسوم إيجار المكاتب وموقف المعدات و الشاحنات	-
التمييز من المجتمع المحلي ضد العمال الأجانب	تنظيم حملات توعوية للمجتمع المحلي بشأن 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	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

الآثار	التدابير التخفيفية
	التدريب على الجوانب القائمة على نوع الجنس وآلية مراجعة الشكاوى (GRM) داخلية وخارجية
عمالة الأطفال في أنشطة البناء	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 حظر عمل الأطفال
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 تغطية المواد المنقولة الالتزام بقواعد المرور تشغيل المركبات التي تتم صيانتها جيدًا
احتمال وقوع حوادث 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 التدريب على الجوانب القائمة على نوع الجنس وآلية مراجعة الشكاوى (GRM)داخلية وخارجية
تعزر وصول المجتمع المحلي إلى الخدمات بسبب أنشطة اعادة التأهيل وإغلاق الطرق مؤقتا	تأمين حركة المرور عبر طرق بديلة للوصول إلى الوجهات ذات الصلة في حال استدعت أعمال التأهيل لإغلاق مؤقت لهذا الطريق إبلاغ المجتمع المحلي عن موقع الطرق المقفلة أو التحويلات من خلال الإعلانات العامة ولافتات التحويل المناسبة آلية مراجعة الشكاوى (GRM) للمجتمعات المحيطة
تعزر دخول المحال التجارية والمواقع الترفيهية بسبب أعمال اعادة التأهيل وإغلاق الطريق مؤقتا مما يؤثر علي رزق أصحاب المحلات والزوار	تركيب هياكل مؤقتة (ألواح خشبية) من الطريق إلى المحلات التجارية ومدخل الموقع الترفيهي والمركز الطبي والمدرسة والمساجد تركيب لوحات الإشارات بشكل صحيح الانتهاء من مرحلة إعادة التأهيل في الوقت المناسب
الصحي (للعمال و المجتمع)	
الحوادث والإصابات التي تلحق بالعمال بسبب أنشطة البناء (المخاطر الصحية التنفسية بشكل رئيسي)	على العمال ارتداء معدات الحماية الشخصية (PPE) المناسبة وجود عدّة الإسعافات الأولية (ثلاثة على الأقل) في موقع البناء إعلام السكان ووضع لافتات بالقرب من مناطق العمل 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
توليد الغبار والضوضاء مسبب في مشاكل صحية للمقيمين القريبين	

ملخص للآثار البيئية والاجتماعية و الاقتصادية المحتملة والتدابير التخفيفية خلال مرحلة التشغيل:

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
تلوث الضوضاء الناجم عن حركة المركبات وارتجاجاتها واستخدام الأبواق	تركيب لافتات بالقرب من المناطق الحساسة لمنع الناس من استخدام أبواق السيارات

التي تزعج السكان في المناطق السكنية القريبة والحياة البرية	
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
حوادث تسرب الزيوت و انتقالها عبر مياه الأمطار الى المياه السطحية والجوفية القريبة	التأكد من صيانة الطريق بانتظام لضمان ظروف سطح جيدة
الحوادث السير الناجمة عن ازدياد حركة المركبات بسبب تحسن أحوال الطرق	
اقتصادي واجتماعي	
تشجيع الفرص التجارية الجديدة والأنشطة التسويقية في المنطقة، وزيادة قيمة الأراضي وتيسير الحصول على الخدمات وتحسين مستويات المعيشة	-
تحسن أحوال الطرق نتيجة تركيب علامات السلامة المناسبة	-
تعزيز السياحة	-
الصحي	
زيادة حركة المرور ومعدلات الحوادث والمخاطر على المشاة	تطبيق أفضل الممارسات المطبقة على السلامة على الطرق

مشاورة العامة وإبلاغها وعرض النتائج

عقدت جلسة مشاركة عامة في بلدية زغرتا يوم السبت، ١٢ تشرين الأول/أكتوبر ٢٠١٩. وكان الغرض من هذه الجلسة اهو إبلاغ أصحاب المصلحة (بما في ذلك المنظمات غير الحكومية في منطقة المشروع)، بالمشروع المقترح لإعادة تأهيل ٤ طرق في قضاء زغرتا وما يصاحبها من أعمال اخرى، ومراعاة ملاحظاتهم. بعد دعوة العديد من أصحاب المصلحة والمنظمات غير الحكومية والاتصال بهم عدة مرات للتأكد من أنهم على علم بالجلسة وأهدافها , شارك في الاجتماع أكثر من ١٤ شخصا، منهم ٤ نساء في الأربعينات والخمسينات، منهم مرأة مديرة مدرسة عامة ، مهندسة زراعية ومديرة محمية إهدن الطبيعية و أخرى مديرة منظمة غير حكومية (منظمة نسائية ثقافية). يذكر ان الرجال هم فى الغالب رؤساء البلديات ونواب الرؤساء او عاملين فى مكاتب هندسة. وخلال الجلسة ، اعرب الحضور عن مخاوف مختلفة وخاصة تلك المتعلقة باختيار الطرق وسلامة العامة على الطرقات. واقترح المشاركين في الجلسة انشاء الأرصفة في المنطقة لضمان السلامة العامة.

وقد أجريت مقابلات مع النساء المشاركات في جلسة منفصلة من أجل اخذ تساؤلاتهم و ملاحظاتهم. وذكروا أن المشروع سيسهم بشكل إيجابي في تحسين مشاركة المرأة في الاقتصاد بجعل النقل أكثر أمانا. لكنهم أشاروا إلى ضرورة وجود آلية تنسيق واضحة مع البلديات والسلطات الأخرى خلال مرحلة إعادة التأهيل لمعالجة المشاكل المحتملة بسرعة. كما يعتقدون أن فترة إعادة التأهيل يجب أن تنفذ خلال فصل الصيف حيث لا توجد مدارس ومعظم السكان في إهدن.

هذه التساؤلات والملاحظات التي طرحت من قبل الموجودين ستأخذ بالاعتبار بالدراسة المقطرحة.

أما بالنسبة للتشاور بين المنظمات غير الحكومية،(١) المحلية: وهي مخصصة لكل قضاء وتتمثل مهمتهم في معالجة مختلف القضايا في المجتمع المحلي، بما في ذلك المسائل الاجتماعية والاقتصادية والمساواة بين

الجنسين والبيئة وتمكين المرأة، وما (٢) الدولية: وهي تغطي البلد كله، وستطبق المشاورة معهم على جميع الدراسات البيئية. يجدر الذكر الى ان 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، سيتم تنفيذ آلية مراجعة الشكاوى GRM خلال مرحلتي اعادة التأهيل والتشغيل. والغرض من هذا هو ضمان توثيق جميع الملاحظات والشكاوى الواردة من أصحاب المصلحة والموظفين والعامة ، والنظر فيها ومعالجتها بطريقة مقبولة وفي الوقت المناسب.علاوة على ذلك ، ستكون آلية مراجعة الشكاوى (GRM) متاحة لجميع أصحاب المصلحة المعنيين وكذلك للموظفين الداخليين ، أي العمال في الموقع(العمال اللبنانيون والسوريون).

الخلاصة

معظم الآثار السلبية للمشروع يتوقع أن تحدث خلال مرحلة 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. 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 زغرتا بل وازالتها من خلال ممارسات خطة ادارة البيئة و المجتمع و الاجراءات الاحترازية المقترحة في التقرير.

1. INTRODUCTION

1.1 Project Background

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

The Roads and Employment Project is funded by the World Bank (WB). Its objectives are (1) to improve transport connectivity along select paved road sections and (2) to create short term jobs for Lebanese and Syrians. The project covers classified 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 Zgharta Caza that is part of Lot 4.

1.2 Project Rationale

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

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

The specific objectives of the project are as follows:

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

[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 construction and implementation of the proposed project;
- Propose mitigation / enhancement measures for the identified impact whenever possible;
- Facilitate informed decision making, including setting the environmental and social 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; and
- Develop a Grievance Redress Mechanism (GRM).

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

1.4 Methodology

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

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

Furthermore, the scope of work included also the development of an institutional setup to ensure that the project implementers have sufficient technical and human resources available to effectively undertake the environmental management and monitoring tasks. As for the participation of the public and concerned communities, this was done through conducting a public hearing in a central location and invited all stakeholders and local community to participate.

2. EXISTING, LEGAL, ADMINISTRATIVE AND POLICIES FRAMEWORK

2.1 National Environmental and Social Legal Framework

The rehabilitation of roads involves a variety of activities that need to abide by national legislations that are enforced by various government institutions. Table 2-1 describes a legal framework governing the REP for Lot 4 in Zgharta, 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	Law4 / Decree5 / 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			

[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.

1933	Decree 2761	The prohibition of wastewater discharge into water streams	States the characteristics of channels and reservoirs where wastewater is discharged. In addition to the prohibition of its discharged into natural environment
1974	Decree 8735	Conservation of Public Hygiene	Solid waste management including collection and disposal is under the control of the municipality. It restricts dumping of wastes in public or private lands adjacent to roads and residential districts
1996	Law 558	Protection of forests	Classifies protected forests and defines the prohibited activities and works into the mentioned forests. It also contains offences and penalties.
1996	MOE Decision 52/1	Requirements to protect air, water, and soil pollution	Allowable noise level according to type of areas and the permissible duration of exposure
2001	MOE Decision 8/1	Revised standards for air emissions, liquid effluents and wastewater treatment plants	The decision sets limits for discharge of wastewater into water bodies
2002	Decree 8803 and its amendments	Regulating stone quarries	It organizes the activity of quarries and crushers, licensing procedures, as well as the operation, management and rehabilitation of quarries.
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
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			
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. As the roads under study are existing roads, the design speed will be assigned based on road condition (existing horizontal curvature and vertical profile).

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. In addition, CDR is responsible for monitoring the implementation of the mitigation measures proposed in the ESMP
Ministry of Public Works and Transportation (MOPWT)	Management of all public roads, for developing a sustainable strategy for the transportation sector, road and street plans within cities and villages	Under the MOPWT, the Directorate General of Roads and Buildings is in charge of the design, execution and maintenance of roads, bridges, walls and water channels. It is responsible for land use planning and cleaning the sides of the roads from wastes
Ministry of Environment (MOE)	Safeguard natural and environmental resources in Lebanon	Setting regulations and standards, and approving implementation and the development of projects sustainably
Ministry of Agriculture (MOA)	The Forestry and Natural Resources Administration of MOA is responsible for constructing public parks and afforestation work in all state lands including communal and private lands. Providing assistance for the implementation of afforestation and reforestation and soil conservation, 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	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

Institution	Main Role	Relevant Role
	administrative independence, which exercises powers and responsibilities over the territory it is granted by law	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)

Parameter	Discharge into Public Sewer	Discharge into Surface Water Bodies
Color	non	non
pH	6-9	6-9
Temperature	35^0C	30^0C
BOD (5 day 20°C)	125 mg/l	25 mg/l
COD (dichromate)	500 mg/l	125 mg/l
Total Phosphorus	10 mg/l	10 mg/l
Total Nitrogen[7]	60 mg/l	30 mg/l
Suspended solids	600 mg/l	60 mg/l
AOX	5	5
Detergents	-	3 mg/l
Coliform Bacteria 37^0 C in 100 ml[8]	-	2,000
Salmonellae	Absence	Absence
Hydrocarbons	20 mg/l	20 mg/l
Phenol Index	5 mg/l	0.3 mg/l
Oil and grease	50 mg/l	30 mg/l
Total Organic Carbon (TOC)	750 mg/l	75 mg/l
Ammonia (NH4+)	-	10 mg/l
Silver (Ag)	0.1 mg/l	0.1 mg/l
Aluminum (Al)	10 mg/l	10 mg/l
Arsenic (As)	0.1 mg/l	0.1 mg/l
Barium (Ba)	2 mg/l	2 mg/l
Cadmium (Cd)	0.2 mg/l	0.2 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
Cobalt (Co)	1 mg/l	0.5 mg/l
Chromium total (Cr)	2 mg/l	2 mg/l
Hexavalent Chromium (Cr vl+)	0.2 mg/l	0.2 mg/l
Copper total(CU)	1 mg/l	0.5 mg/l
Iron total (Fe)	5 mg/l	5 mg/l
Mercury total (Hg)	0.05 mg/l	0.05 mg/l
Manganese (Mn)	1 mg/l	1 mg/l
Nickel total [Ni)	2 mg/l	0.5 mg/l
Lead total (Pb)	1 mg/l	0.5 mg/l
Antimony (Sb)	0.3 mg/l	0.3 mg/l
Tin total (Sn)	2 mg/l	2 mg/l
Zinc total (Zn)	10 mg/l	5 mg/l
Active (Cl2)	-	1 mg/l
Cyanides (CN+)	1 mg/l	0.1 mg/l
Fluorides (F)	15 mg/l	25 mg/l
Nitrate (NO3-)	-	90 mg/l
Phosphate (POP43-)	-	5 mg/l
Sulphate (SO42-)	1,000 mg/l	1,000 mg/l
Sulphide (S2-)	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 World Bank Policies

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

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

Since the project activities are focused mainly on road maintenance and rehabilitation activities, thus the majority of impacts are expected to be localized and temporary. As such, this project falls under Category "B" according to the Project Appraisal Document (PAD) and the Environmental and Social Management Framework (ESMF) (CDR, 2018).

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

2.4.1 Public Consultation and Access to Information Policy

According to OP/BP 4.01, the Bank requires that a public consultation with project-affected people and local nongovernmental organizations (NGOs) must be conducted for all projects under Category A and Category B. The aim of the consultation is to present to the public the components of the project along with potential environmental and social impacts and takes their comments and concerns into consideration. Under Category B projects, it is required to conduct at least one formal public consultation which is usually done during the ESMP draft stage. Moreover, during the implementation of the proposed project, the borrower has to consult with such affected and interested groups in order to address any environmental or social issue that may arise.

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

2.4.2 Guidelines and Manuals

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

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

2.5 International Treaties and Conventions

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

Table 2-7: Relevant International Treaties and Conventions

Convention	Ratification	Description
United Nations Framework Convention on Climate Change (UNFCCC) - 1992	Ratified through Law No. 359 (1994)	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.

2.6 Environmental Health and Safety (EHS) Guidelines of the World Bank Group

2.6.1 Occupational Health and Safety

The World Bank Group has adopted a set of Occupational Health and Safety guidelines that need to be adhered to during project implementation. Applicable to this project are those related to the following:

- Communication and training
- Physical hazards such as rotating and moving equipment, noise, vibration, electrical, welding, working environment temperature, and working at heights
- Chemical hazards such as air quality and fire and explosions
- Personal protective equipment
- Monitoring of accidents and diseases

2.6.2 Community Health and Safety

The Community Health and Safety Guidelines adopted by the World Bank Group addresses some aspects of project activities taking place outside of the traditional project boundaries, but nonetheless related to the project activities. These issues may arise at any stage of a project life cycle and can have an impact beyond the life of the project. They include topics such as water quality and availability, structural safety of project infrastructure, life and fire safety, traffic safety, transport of hazardous materials, disease prevention and emergency preparedness and response.

2.6.3 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 World Bank Group in the Environmental, Health, and Safety Guidelines for environmental wastewater and ambient water quality (WBG, 2007) and the allowable contaminants concentration for wastewater when discharged into the surface water bodies according to the MOE decision 8/1 dated 30/1/2001.

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

Pollutant	EHS guidelines for treated sanitary sewage discharges	National discharge to surface water bodies decision 8/1
pH	6-9	5-9
BOD	30 mg/L	100 mg/L
COD	125 mg/L	250 mg/L
TN	10 mg/L	30 mg/L
TP	2 mg/L	10 mg/L
Oil and Grease	10 mg/L	30 mg/L
TSS	50 mg/L	200 mg/L
Total coliform bacteria	400	-

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

2.6.4 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 (except for TSP for which the NAAQS are more stringent than 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, except for TSP, where the NAAQS levels will be adopted.

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

Parameters	WHO Guidelines ($\mu G/M^3$)	NAAQS Maximum Levels ($\mu G/M^3$)
Sulfur dioxide (SO_2)	500 (10 minutes) 20 (24 hrs)	NA
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

2.6.5 Noise Management

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

Table : 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

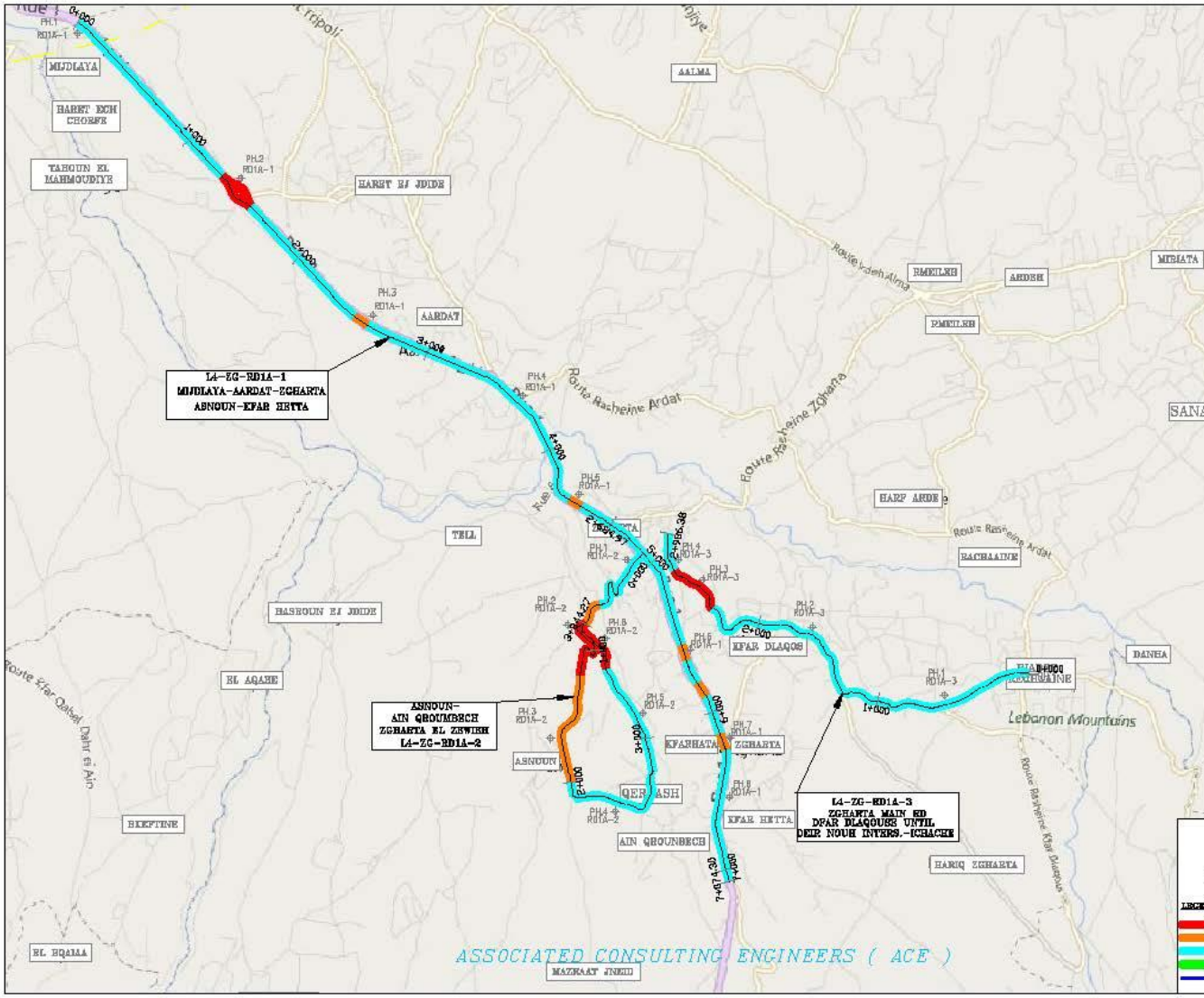
Institutional	55	45	-	-	-
Educational	55	45	55-65	50-60	45-50
Industrial	70	70	60-70	55-65	50-60
Commercial	70	70	55-65	50-60	45-50

3. DESCRIPTION OF THE PROPOSED PROJECT

3.1 Location

The study area where the proposed roads are located is in the Caza of Zgharta of North Lebanon Governorate. The total number of the proposed roads to be rehabilitated under this project is 4 roads with a total length of 19.015 km. All of the roads are already existing and need rehabilitation works. The length of each road along with the municipalities that is passing through is presented in the table below (Table 3-1).

An overview of the proposed roads locations is presented in Figure 3-1: Pavement Condition Plan for Roads L4-ZG-RD-1A-1, L4-ZG-RD-1A-2 and L4-ZG-RD-1A-3 in Zgharta Caza



and Figure 3-3 while the location of each of the project roads are represented in the maps illustrated in Figure 3-5, Figure 3-6, Figure 3-7 and Figure 3-8.

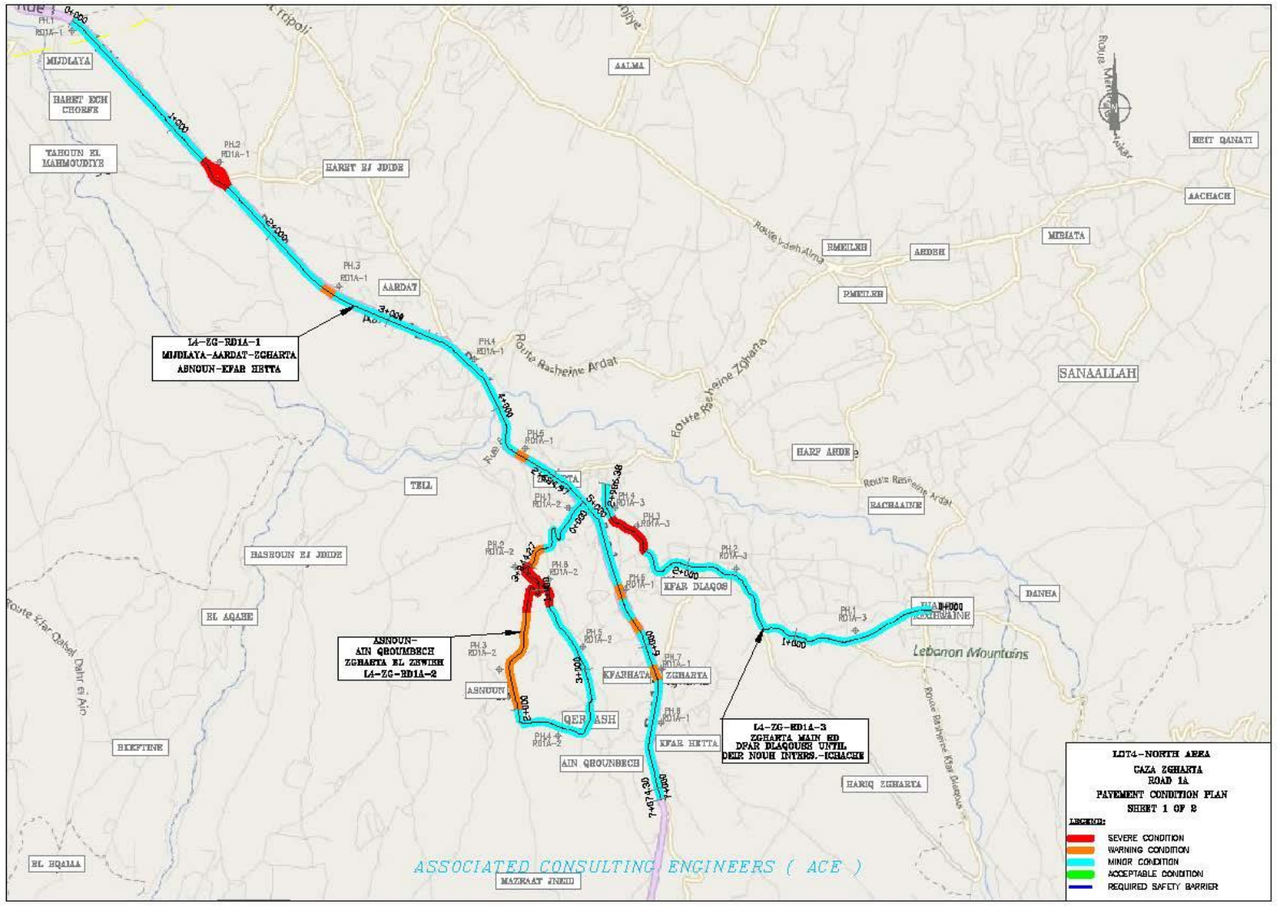
Table 3-1: Proposed Roads within the Caza of Zgharta (Road 1A and 1D)

Road Code	Road Name	Alignment Name[1]	Classification	Municipalities	Length (m)	Average Width (m)
Road 1A	Mijdlaya – Aardet	L4-ZG-RD1A-1	Primary	Mejdlaya	7,074.30	11.7

Road Code	Road Name	Alignment Name[1]	Classification	Municipalities	Length (m)	Average Width (m)
(RD1A)	– Zgharta – Asnoun – Kfar Hetta			Ardate Zgharta Kfar Hata		
	Asnoun – Ain Qroumbech – Zgharta El Zewieh	L4-ZG-RD1A-2	Tertiary	Zgharta Asnoune Karabeiche Kfar Hata	3,844.27	6.0
	Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh	L4-ZG-RD1A-3	Secondary	Zgharta Kfar Dalakoss Rachehine	2,986.38	7.7
Road 1D (RD1D)	Bchinnine – Kfarchakhna – Kfar Zeina	L4-ZG-RD1D	Tertiary	Bchenine Kfar Chakna Kfar Zeina Al-Jdeidé	5,110.11	5.7
Total Length (m)					19,015.06	-

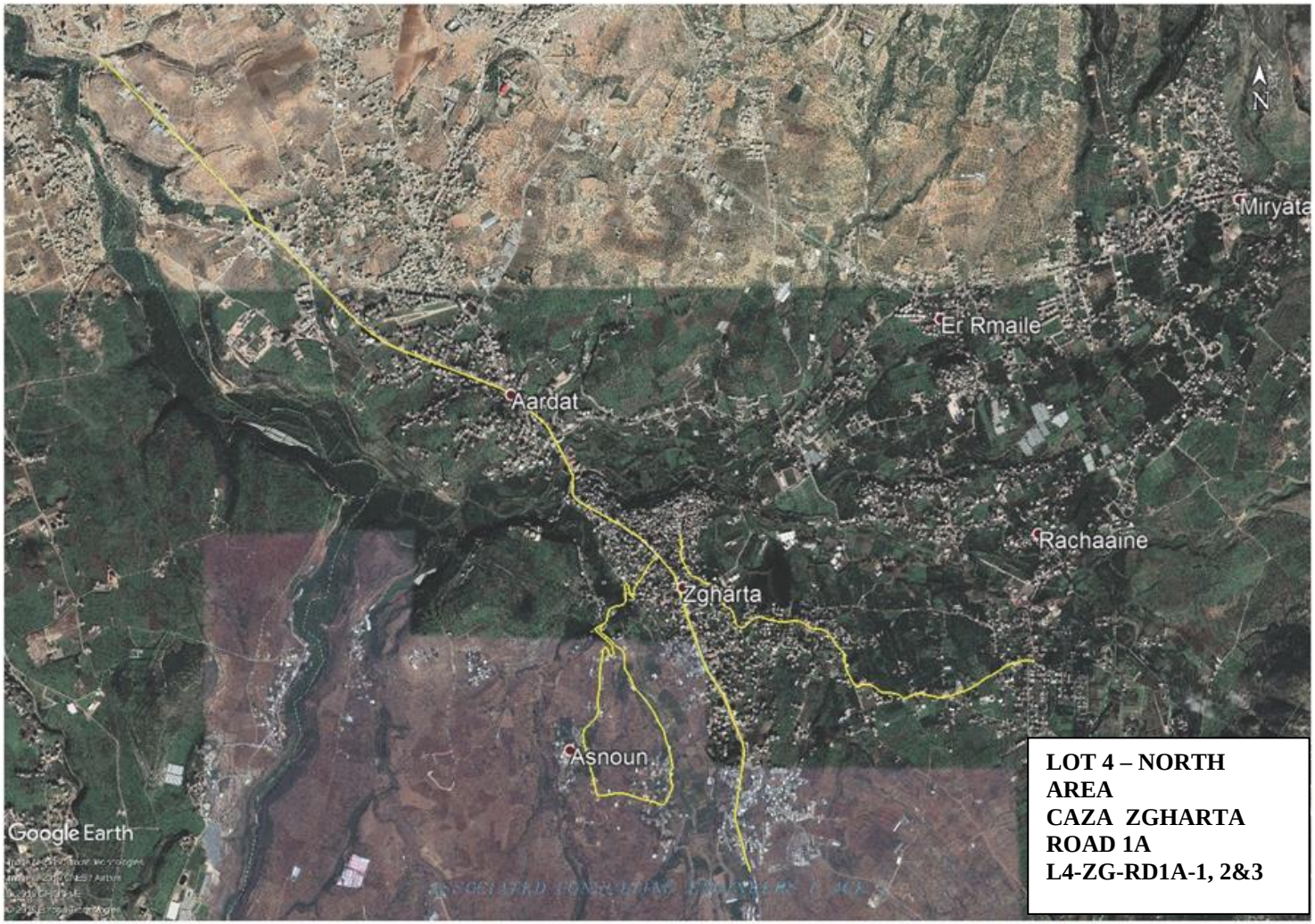
[1]The code for the roads represents the road label for example for L4–ZG–RD1A–1: L4=LoAlt No.4 (Lot Number as per Contract), ZG=Zgharta (Name of Caza as per Contract), RD1A-1=Road label (as per Contract) such that 1 represents the number of the alignment.

Figure 3-1: Pavement Condition Plan for Roads L4-ZG-RD-1A-1, L4-ZG-RD-1A-2 and L4-ZG-RD-1A-3 in Zgharta Caza



Source: ACE

Figure 3-2: Overview of Location of Road L4-ZG-RD-1A-1, L4-ZG-RD-1A-2 and L4-ZG-RD-1A-3 in Zgharta Caza

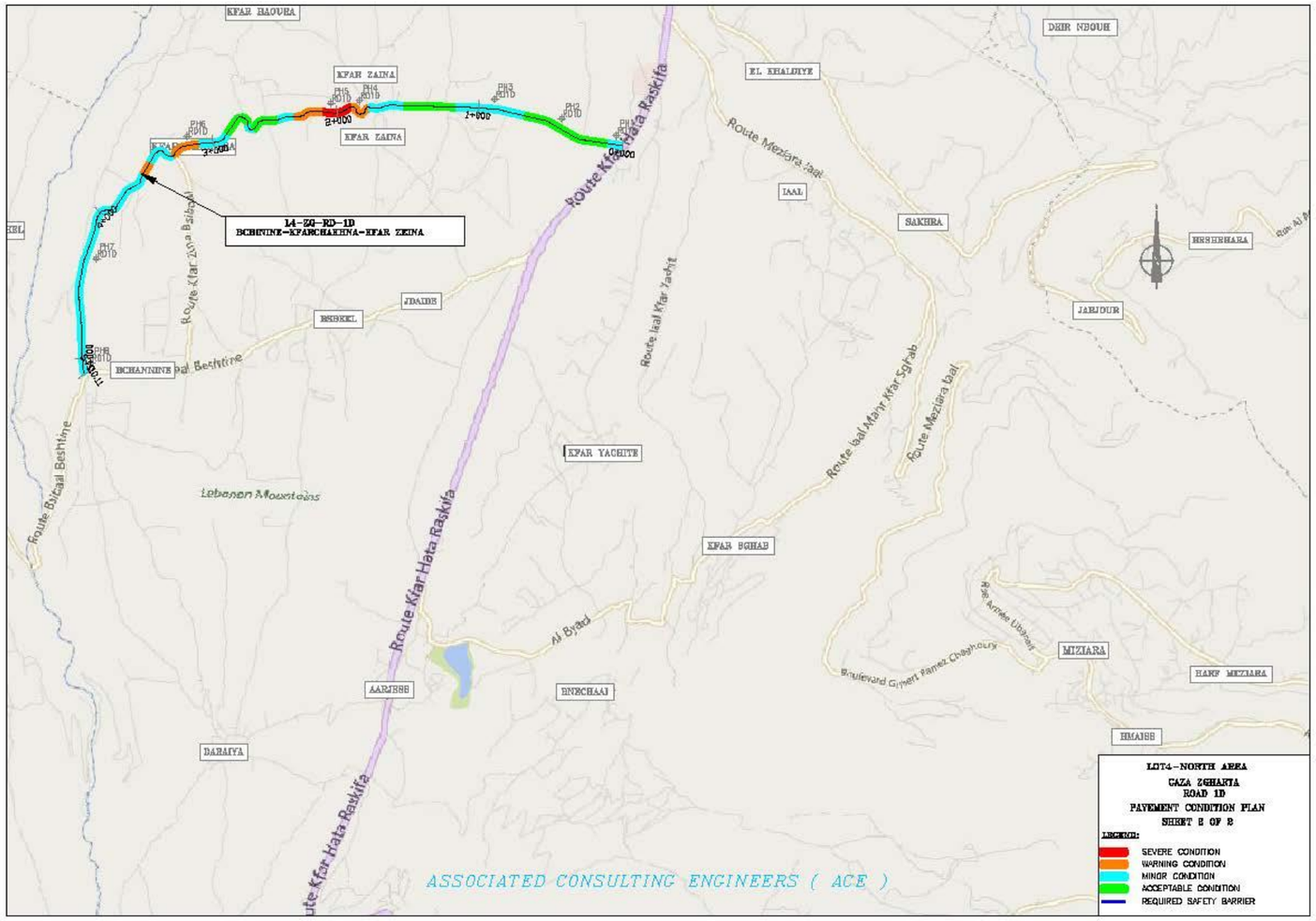


Source: Google Earth, 2019

Figure 3-3: Overview of Location of Road 1D in Zgharta Caza

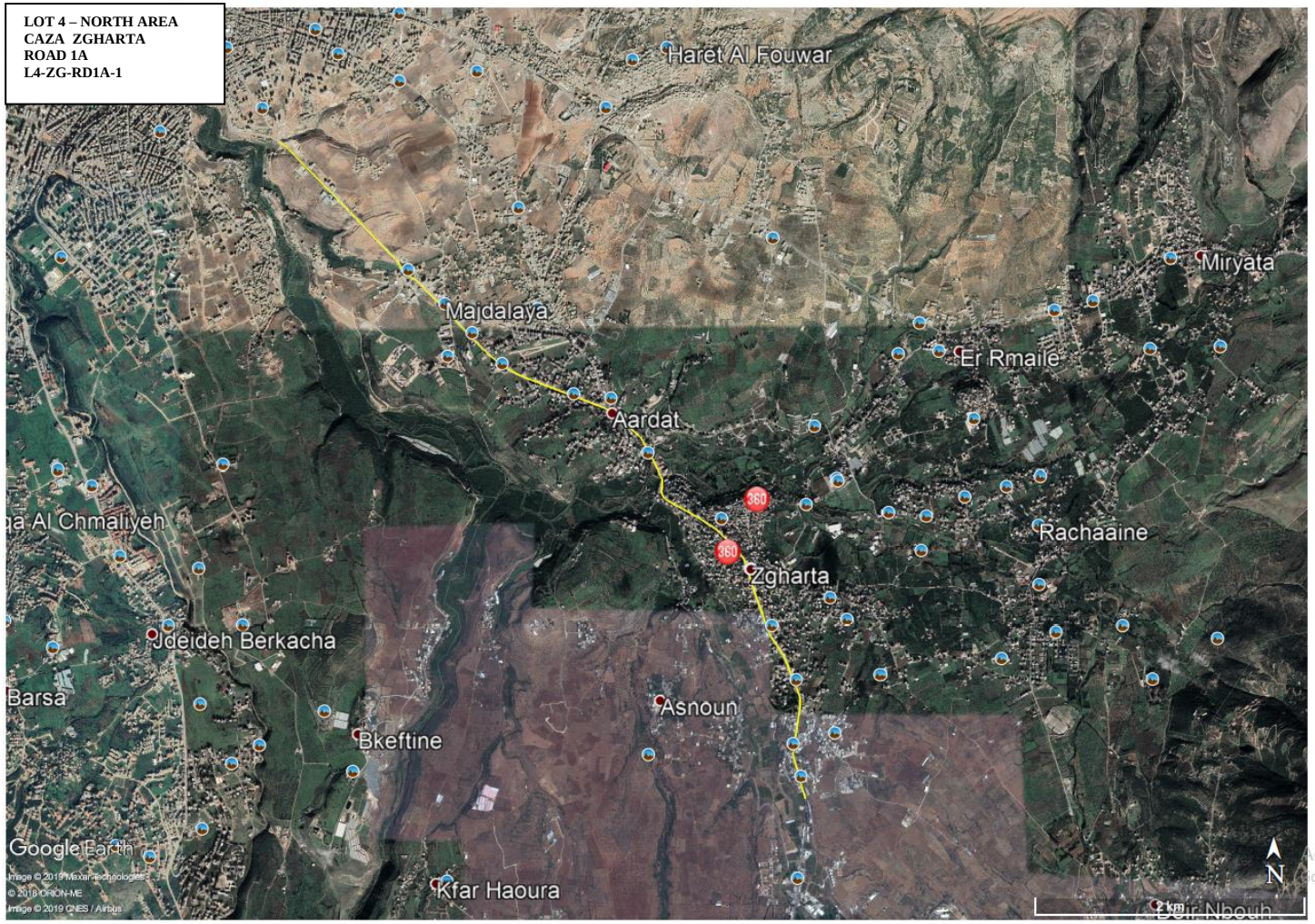
Source: Google Earth, 2019

Figure 3-4: Pavement Condition Plan for Road L4-ZG-RD-1D in Zgharta Caza



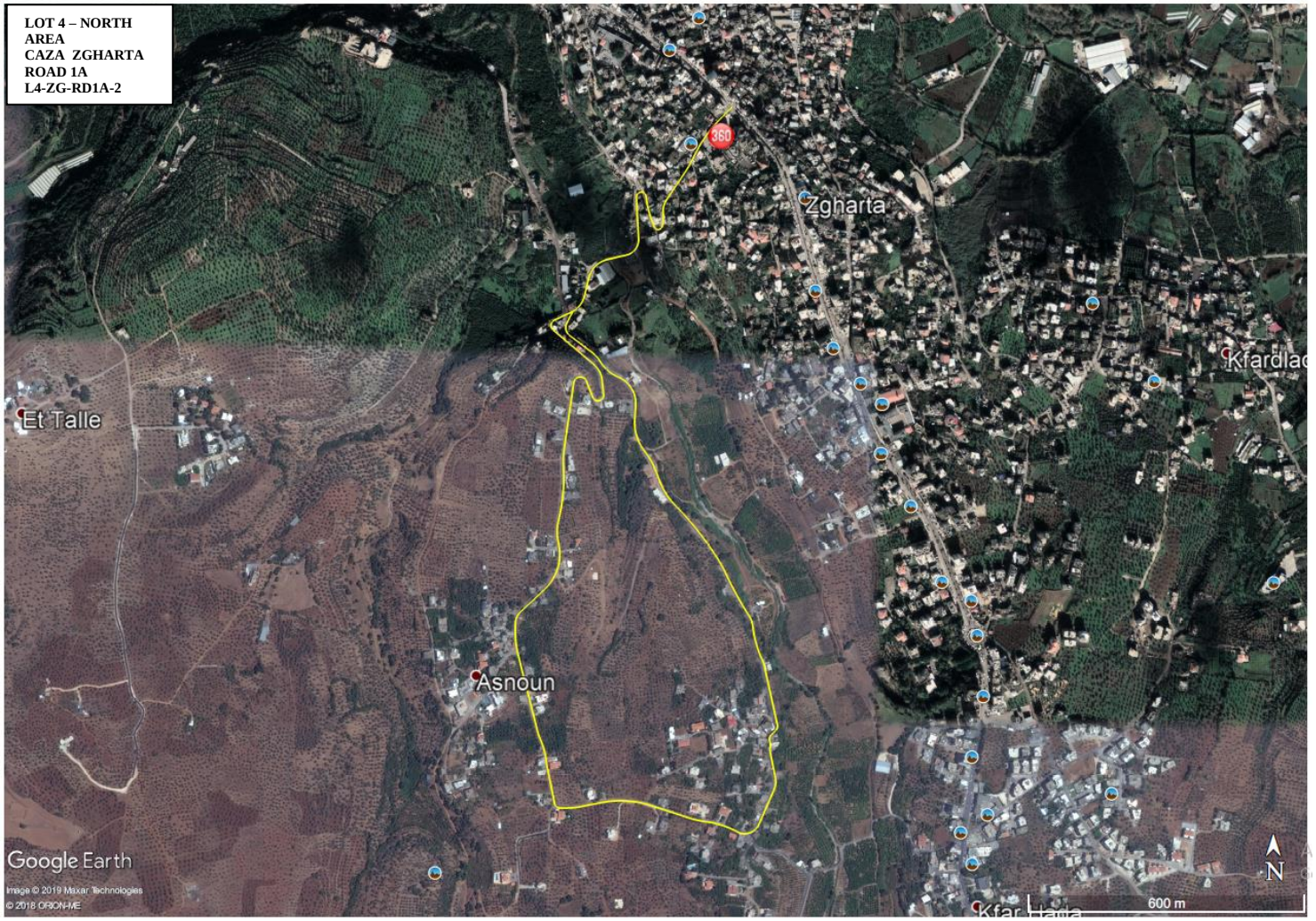
Source: ACE

Figure 3-5: Road L4-ZG-RD1A-1



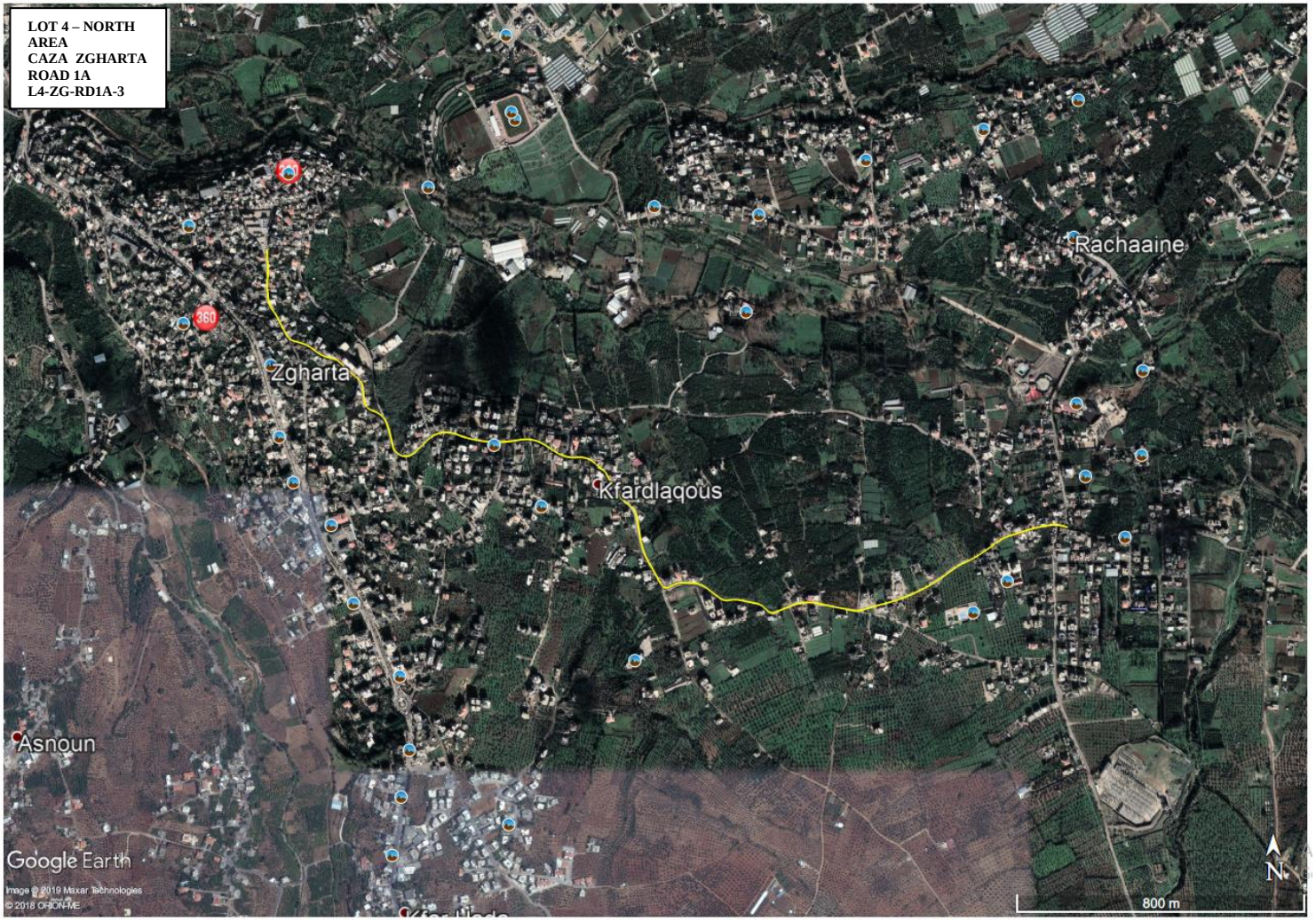
Source: Google Earth, 2019

Figure 3-6: Road L4-ZG-RD1A-2



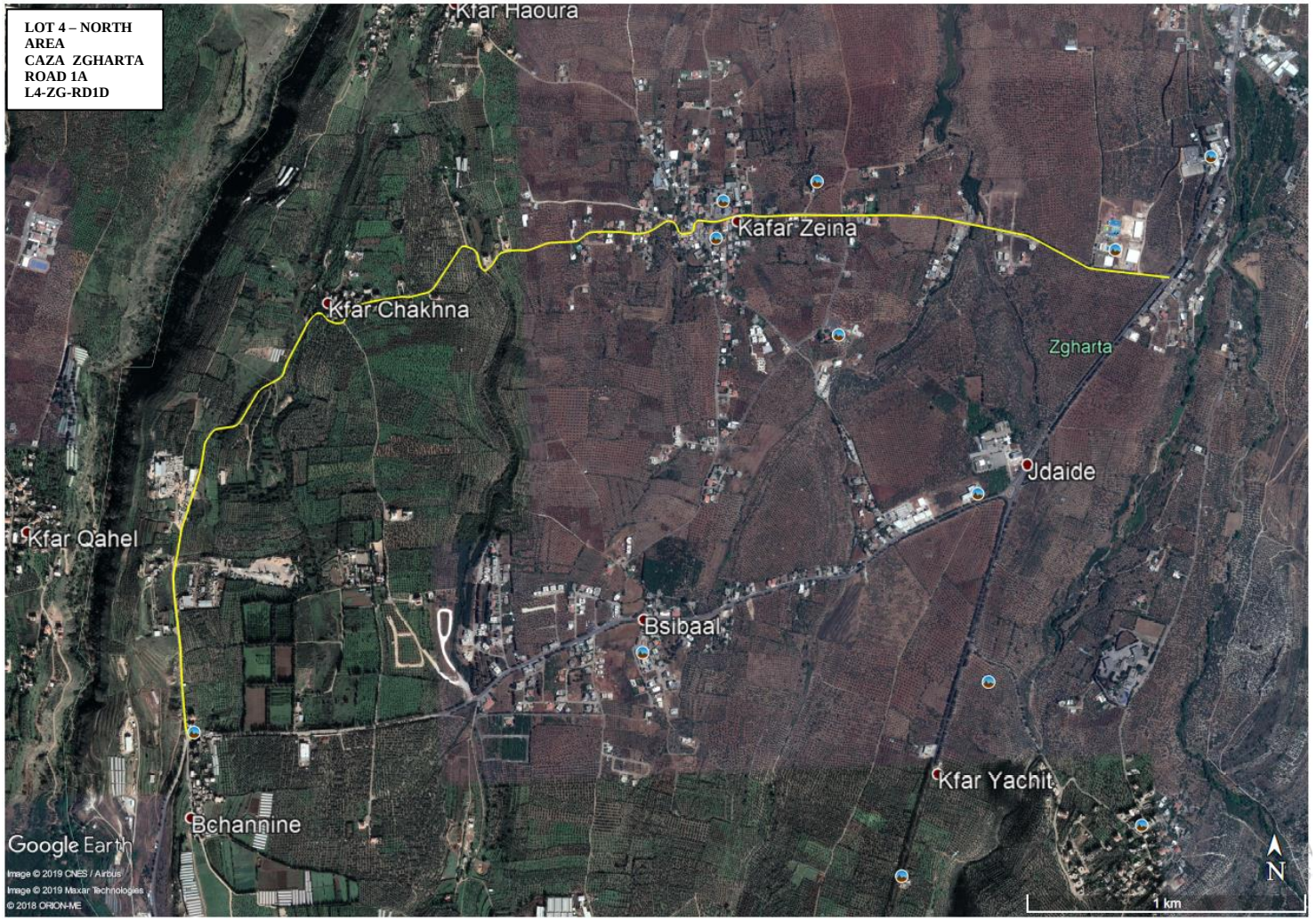
Source: Google Earth, 2019

Figure 3-7: Road L4-ZG-RD1A-3



Source: Google Earth, 2019

Figure 3-8: Road L4-ZG-RD-1D



Source: Google Earth, 2019

Photos that were taken during the site visits can be found in Figure 3-9 and Figure 3-10.

Figure 3-9: Residential Areas Along One of the Proposed Roads (L4-ZG-RD1A-1)

Source: HK, ACE - November 2018

Figure 3-10: Green Areas on Both Sides of One of the Proposed Roads (L4-ZG-RD-1D)

Source: HK, ACE – November, 2018

3.2 Project Activities

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

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: Asphalt Conditions for Each of the Proposed Roads (Based on visual Assessment)

Road Code	Severe Conditions (requires reconstruction)	Warning Conditions (requires major rehabilitation)	Minor Conditions (requires minor rehabilitation)	Acceptable Conditions
L4-ZG-RD1A-1	5.00%	0.00%	95.00%	0.00%
L4-ZG-RD1A-2	23.15%	22.01%	54.84%	0.00%
L4-ZG-RD1A-3	3.62%	16.74%	79.64%	0.00%
L4-ZG-RD1D	3.91%	12.72%	56.95%	26.42%
Total	8.16%	10.5%	74.24%	7.10%

The next step is a thorough visual examination of the identified distresses. After carrying out further studies such as Geotechnical investigation, Automated Traffic Counts and Road geometry (topographic surve0079), 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.

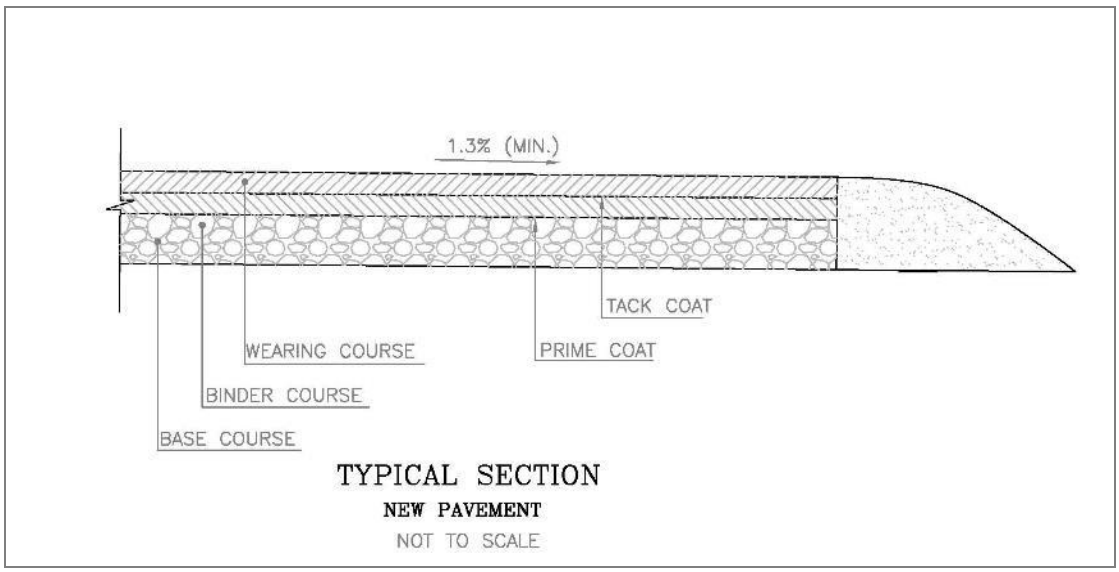
B- Phases of Construction for a stretch of road that needs: Milling & Overlay

- 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 3-11)

- 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 3-11: New Pavement Cross Section Scheme



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

- Station 1,300 m – 1,600 m of RD 1A-1,
- Station 0 m – 1 km 304 m, 3km 500m – 3km 840m of RD 1A-2,
- Station 2km 400m – 2km 760m of RD 1A-3,
- Station 1km 703 m – 5km 100 m of RD 1D.

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

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

During the execution of rehabilitation works for a specific road, and in case the works imply the temporary closure of this road, other ancillary and associated works including traffic management during rehabilitation, reinstatement of roads disturbed by the works and tapering to the existing roads as necessary. Thus, traffic will be secured by the project operators via alternative routes to reach relevant destinations. However, the implementation of detours, diversions and road blockage will be determined during the rehabilitation phase by the contractor. The consultant's supervision team as well as the traffic department of CDR have to agree to the location of traffic relocation in consultation with the affected communities

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 centerline for each road, in which the existing radius of each curve could be identified and posted the speed limit that complies with the minimum radius of curvature. The applicable speed limit for most of the roads were 60 kph based on road geometry in general cases and was reduced accordingly at stretches where sharp curves were encountered in which it was reduced as much as to reach 30pkh at very sharp curves.

3.3 Materials and Equipment

The required main materials and equipment for the rehabilitation of the proposed roads and its associated works are presented below.

Material used during the rehabilitation works:

- Aggregates (fine and coarse)
- Asphalt mix
- Liquid Asphalt
- Concrete mix
- Water
- Fuel
- Thermoplastic Paint Material
- Steel Guardrails
- Stones (for stone pitching)
- Reinforcing Steels
- Manhole Covers
- Rubber Bitumen
- Cat Eyes
- Delineators
- Traffic Signals

Equipment used during the rehabilitation phase:

- Steel-wheeled Rollers
- Pneumatic-tyred Rollers
- Asphalt Distributor
- Concrete mixing trucks
- Trucks
- Excavators
- Loaders
- Asphalt Milling Machines

- Steel Rollers
- Motor Graders
- Thermoplastic Road Marking Machines
- Liquid Asphalt Spraying Tanks
- Guardrail Post Driving Machines
- Paver instead of Asphalt Distributors

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. It is estimated that the rehabilitation phase will extend over a period of 15 to 18 months 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 3-3 and Table 3-4 per task and per day. All rehabilitation activities need the involvement of a certain number of workers ranging from unskilled labors to equipment drivers to foremen/engineers. As described in Table 3-4, the activities vary from pavement works to earthworks, piping, electrical, structural, and road safety. Each of such activity require specialized/skilled resources. As shown in Table 3-3 and Table 3-4 below, the number of persons involved from engineers, technicians to workers as well as machinery drivers is variable as per the activity needed on each road. It is assumed that an estimate total number of workers shall range between 150 and 250. In addition, efforts will be made by the contractor to equally hire local (from the same region as the project location) and foreign workers and drivers with equal contractual benefits and working conditions, to avoid or minimize social tensions and to compensate the workers equally. The workers will need to sign code of conduct (Annex 2) before starting the work and training sessions will be conducted to inform the workers about their responsibility to act ethically and to avoid and prevent sexual exploitation and abuse.

and to avoid and prevent sexual exploitation and abuse.

Table 3-3: 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	9
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 3-4: 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
1	Pavement Patching	1	1		2		1	1	1	1	1						1
2	Milling & Overlay	1			1	1	3	1	1	1	1						1
3	Pavement Total Reconstruction	1	2	1	2	1	6	1	1	1	1						1
4	Concrete Retaining Walls							1				1		1	1		1
5	Concrete Safety Barriers							1						1	1		1
6	Electrical Street Lighting Work											1					1
7	Culverts & Channels	1						1						1			1
8	Traffic Marking							1				1				1	1
9	Guardrails Fixing						1						1				1
10	Sidewalk & Tiling							1									1
11	Structural Elements							1				1		1	1		1
12	Earthwork (Excavation & Backfill)		2		1		2	1									1
13	Piping or Pipe Repair																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 Project Offices. These offices will be used by the Contractor Engineers, technical skilled workers and Supervising Consultants. The flat will be equipped with toilet, kitchen (including drinking water and appliances), lockers and other supplies needed for the daily administrative activities. It might also serve as a meeting point for all Project workers at the start and end of their shifts.

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

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

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.
Note that an internal Grievance Redness Mechanism (GRM) will be available for the workers onsite during the rehabilitation phase. The purpose of a grievance mechanism is to ensure that all feedback and complaints received from the all workers (skilled and unskilled labor) are documented, considered and addressed in an acceptable and timely manner. A formal grievance mechanism allows for complaints to be made in person, in writing, by telephone (01/980096 - Ext. 317) or online (rstephan@cdr.gov.lb) using the form found in Annex 4

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 Zgharta. 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

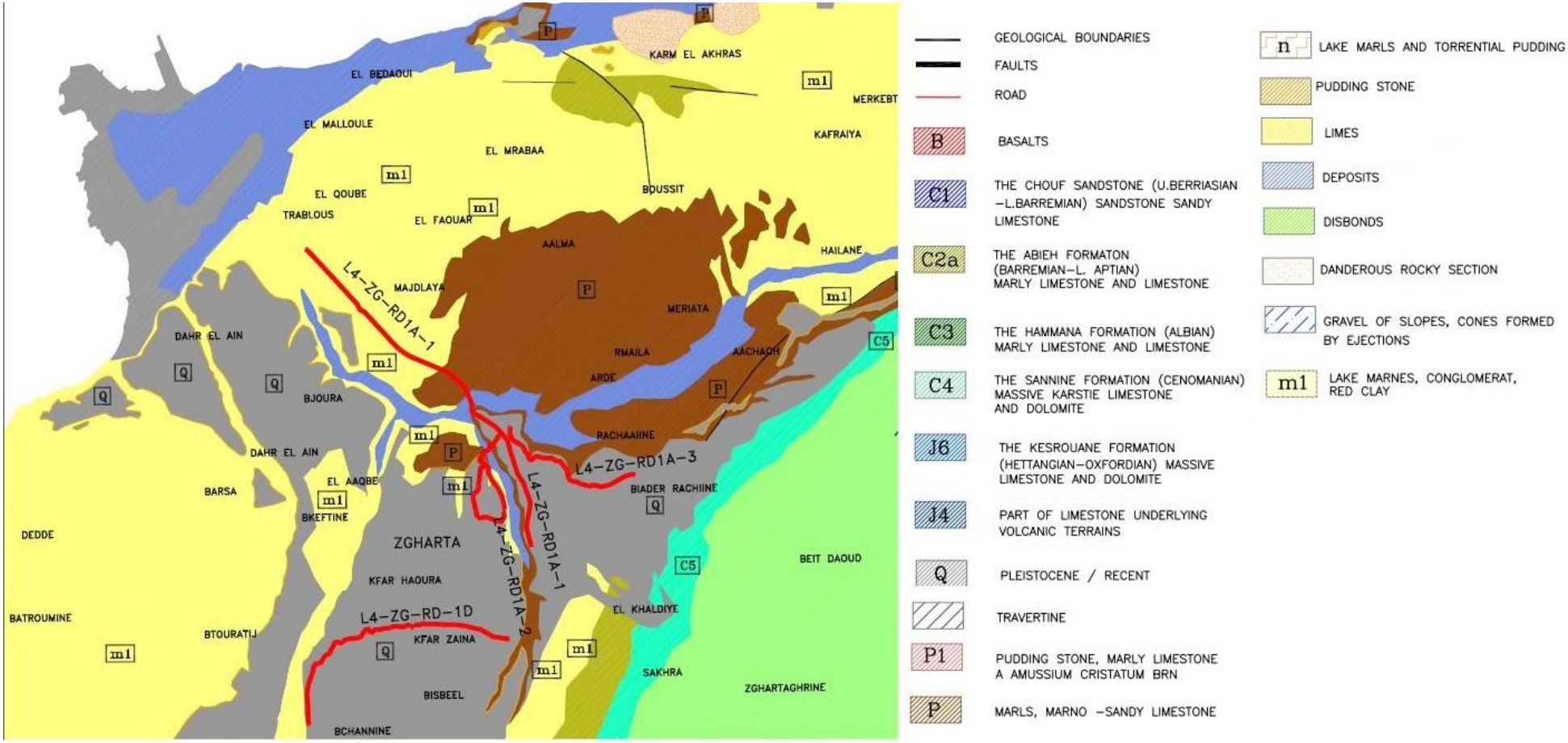
Zgharta of the North Governorate, where the proposed roads are located, is about 88 km away from the capital of Beirut. The different altitudes of this district vary between 90 meters on the West, and 1,850 meters at the level of the mountainous summits, in the East (localiban website, 2019). The villages of the project area lie between 62 meters to 242 meters above sea level.

4.1.2 Geology

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

- Pleistocene (q): this formation belongs to the quaternary geological unit. It is composed of loose Eolian and cemented sands. Also residual soil including Terra Rosa are found in this formation. In addition, this geological unit is composed of loose alluvium, unconsolidated soil and sediments.
- Miocene - marly conglomerates and reef limestones (m2): weathered grey marl that was originally loose marine greenish marl. This formation is inter-bedded with marly limestone in some parts. The thickness of this outcropping is around 150 m and is known to be reach in foraminifera fossils.
- Marl of Neogene (mL): this unit is composed of continental conglomerate and sand, with thick mud on the top layer. The thickness of this outcropping ranges between 50m to 100. This is reach in foraminifera fossils.
- Pliocene (P): this formation belongs to the tertiary geological unit. It is characterized by its conglomerate, sandstone and sandy marine marl. The color of this formation is bluish and has a thickness ranging between 300 to 400 m.

Table 4-1: Geological Map of Study Area



Source: Prepared by E.D. based on the geological map of Dubertret scale 1/50000 (Trablous feuille NI - 36-XVIII-2d)

4.1.3 Hydrogeology

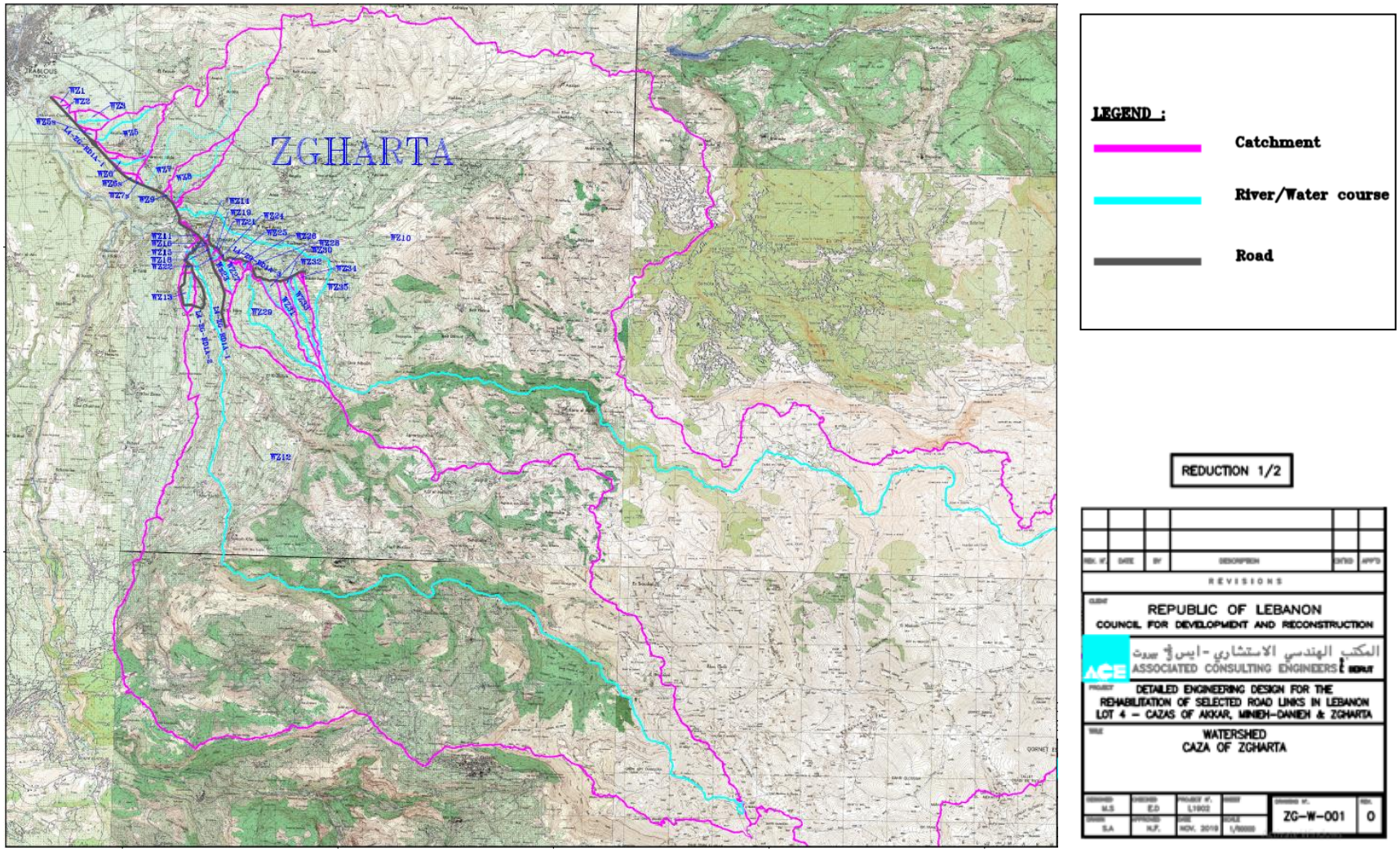
The Caza of Zgharta lies between the river of Rachiine from its source to its meeting point with Jouiit river (Platau, 2016). During the site visits, one river and two streams were seen in the surroundings of the study area and the proposed roads (Annex 1). These rivers and streams discharge into Abou Ali River. It is worth to mention that there are no springs located within the study area. During the site visits, some of the roads' sections of the project were either at proximity or cross a river or a water course. A river was identified near road L4-ZG-RD-1A-2 (Ain Qrombech village) and two streams were identified at proximity of the roads L4-ZG-RD1A-3 Kfardlaqous village and L4-ZG-RD-1D. Figure 4-1 shows the observed stream passing at the beginning of Road RD-1D at Kfarchakhna village.

Figure 4-1: Stream passing at the beginning of road RD1D

Source: HK, ACE-November, 2018

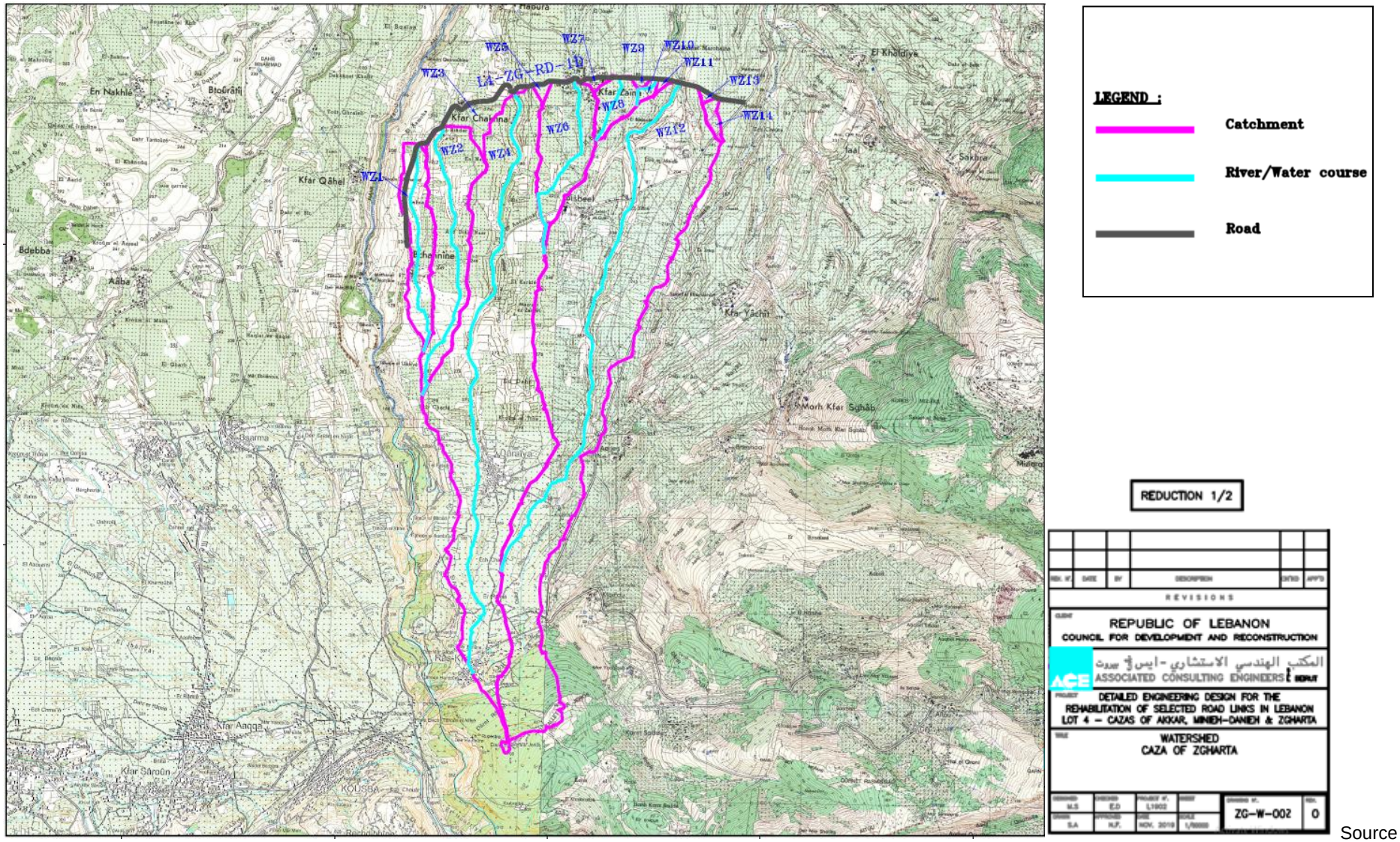
Figure 4-2 and Figure 4-3 show the proposed roads of the project with respect to the rivers and their watersheds in the Caza of Zgharta.

Figure 4-2: Water Courses in Zgharta District and Location of Existing Project Roads (L4-ZG-RD-1A-1, L4-ZG-RD-1A-2, L4-ZG-RD-1A-3)



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

Figure 4-3: Major Rivers in Zgharta District and Location of Existing Project Roads (L4-ZG-RD-1D)

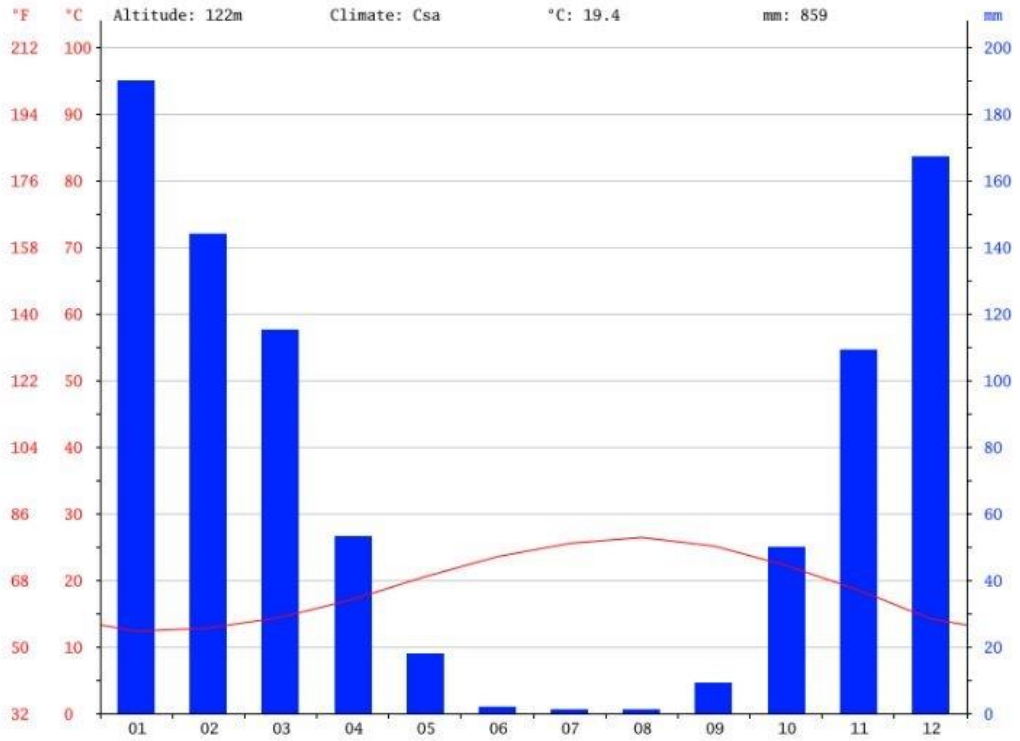


Source : Armée Libanaise, Source: Direction des Affaires Géographiques, échelle 1/20000

4.1.4 Climate and Meteorology

The most rain events in the Caza of Zgharta fall in the winter during the month of January with an average of 190 mm. However, the driest month is July, with 1 mm of rain. The average annual rainfall in Zgharta is 859 mm (Figure 4-4).

Figure 4-4: Climograph of Zgharta at 122 m (Historical Data between 1982 - 2012)

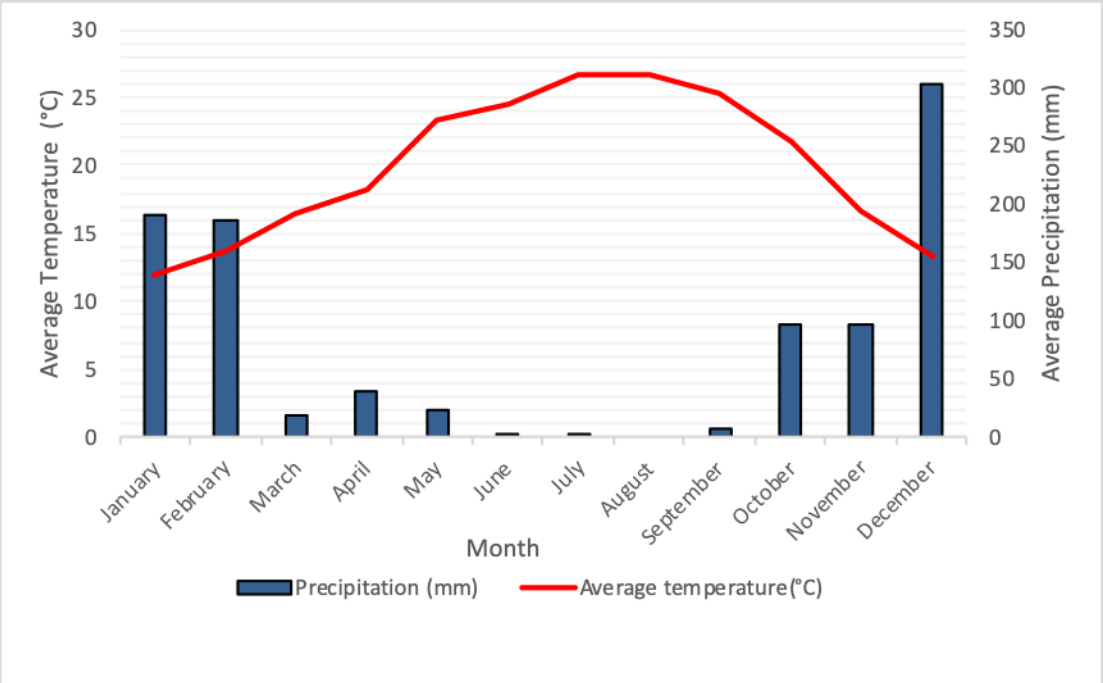


Source: climate-data.org, 2019

The average annual temperature in Zgharta is 19.4 °C. The warmest month of the year is August with an average temperature of 26.4 °C. On the contrary, the coldest month of the year is January with an average temperature of 12.3 °C (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 Kfar Chakhna that is part of the project and located on road L4-ZG-RD1D at the altitude 198 meters. This data represents the average temperatures and average precipitation of the year 2018 (Figure 4-5).

Figure 4-5: Climograph of Kfar Chakna of LARI Station for the Year of 2018



Source: LARI, 2018

As for the wind data, wind speed and direction data were also obtained from LARI from its station in the village of Kfar Chakhna that is part of the project and located on road L4-ZG-RD1D at the altitude 198 meters. Table 4-2 represents the average monthly and annual wind speed and direction for the year of 2018.

Table 4-2: Monthly and Yearly Averages of Wind Speed (m/s) and Direction (degrees) registered by Kfar Chakhna's LARI Station in 2018.

Month	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual Average 2018
Average Wind Speed (m/s)	0.22	0.14	0.36	0.16	0.29	0.83	0.89	0.71	0.37	0.14	0.05	0.22	0.36
Average Wind Direction (degrees)	136.71	136.03	136.16	136.96	136.35	146.66	135.71	127.41	121.63	123.74	123.46	126.35	132.26

Source: Data provided by LARI on January 2, 2020

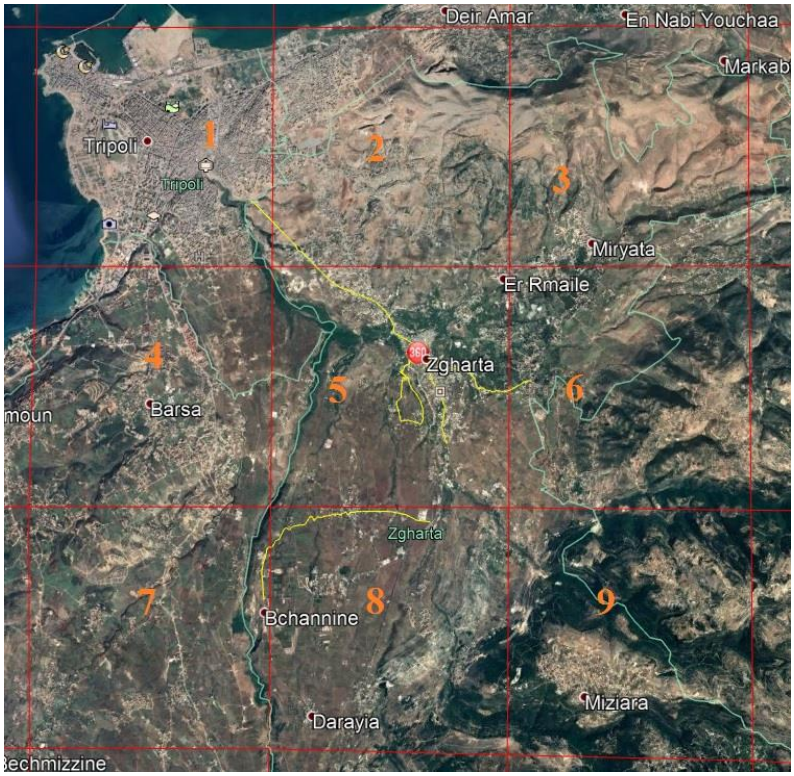
4.1.5 Air Quality and Noise

Ambient air quality of the project area was requested from MOE. Data was available from the UNDP project "Air quality assessment in an East Mediterranean country: the case of Lebanon" which is based at the Ministry of Environment for the year 2010. The available data is for criteria pollutants: Particulate Matter (PM), Ozone (O_3), Carbon monoxide (CO), Nitrogen dioxide (NO_2), Sulfur dioxide (SO_2). The project area was divided into different cells[9] (Figure 4-4-6) and the data of the annual

[9] According to the study "Air quality assessment in an East Mediterranean country: the case of Lebanon", the country was divided into cells in order to monitor major air quality parameters in different areas across Lebanon using five stations located in North Lebanon, South Lebanon, Beirut (2 stations), and in Bekaa.

background average concentrations in µg/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 4-4-6: 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 (The Roads are Located on Cells 1,2, and 5 to 8) for the Year of 2010

Pollutant (µg.m^{-3})	NO_2	O_3	PM_{10}	$PM_{2.5}$	SO_2	CO
Concentration in Cell 1	60.165	55.908	36.320	30.877	41.201	852.235
Concentration in Cell 2	53.812	55.032	31.070	26.860	37.568	746.243
Concentration in Cell 5	28.346	72.899	22.849	19.321	21.309	405.649
Concentration in Cell 6	18.134	80.318	19.318	16.493	14.880	305.455
Concentration in Cell 7	22.243	77.623	21.680	17.674	15.915	360.442
Concentration in Cell 8	17.525	80.525	19.635	16.575	13.803	308.664
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 while two cells representing a section from Road L4-ZG-RD1A-1 are not in compliance with WHO standards, which are stricter than the national ones. As for the concentrations of $PM_{2.5}$ and PM_{10}, the obtained values were not in compliance with the WHO standards for air quality except the obtained concentrations in cells 6 and 8 that were below the standard for PM_{10}.

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

4.1.6 Land Use/Land Cover

Natural terrains with little vegetation dominate the majority of areas around the project roads. In addition, several types of trees are found along the roads as follows:

- Many orchards of orange trees and olive agriculture fields were noticed along roads L4-ZG-RD-1A-2 (Asnoun – Ain Qroumbech – Zgharta El Zewieh) and L4-ZG-RD-1A-3 (Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh)
- Some cypress trees were planted near households along the roads L4-ZG-RD-1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) and L4-ZG-RD-1A-3 (Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh).
- Road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) has palm trees along its separation.
- The Rachiine River that crosses the village of Zgharta runs along near road L4-ZG-RD-1A-2 (Asnoun – Ain Qroumbech – Zgharta El Zewieh).
- Some pine trees were observed along road L4-ZG-RD-1D (Bchinnine – Kfarchakhna – Kfar Zeina) and in a fenced area near road L4- ZG-RD1A-3 (Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh).

Table 4-4 presents a visual classification of land use around the villages where the project roads pass.

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

Municipality	Land Use
Mejdlaya	Sparsely populated with dense agricultural areas
Ardate	Densely populated with agriculture areas
Zgharta	Densely populated
Kfar hata	Sparsely populated with agriculture areas
Asnoune	Sparsely populated with dense agriculture areas
Karabeiche	Moderately populated with agriculture areas
Kfar Dalakoss	Densely populated with agriculture areas
Rachehine	Moderately populated with agriculture areas
Bchenine	Sparsely populated with dense agriculture areas
Kfar Chakna	Dense agriculture areas
Kfar Zeina	Moderately populated with agriculture areas

Source: Google Maps, 2019

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

4.2 Biological Environment

4.2.1 Flora

The caza of Zgharta is rich in agricultural fields and forests that are distributed between altitudes ranging from 100 to 3,000 m. The Caza encompasses the famous Horsh Ehden Nature Reserve rich in biodiversity and specially cedar, oak and pine trees. Agriculture areas are intensively planted and encompass olive fields, citrus and fruit trees such as figs and orange trees (Figure 4-7). Natural areas include mainly dense forests of fir, oak, pine and mixed forests, shrublands and grasslands. In addition, the caza represents important riparian ecosystems in the rivers and streams that passes through the study area namely near Rachine River. (Platau, 2016).

Figure 4-7: Orange Trees along on of the Proposed Roads (L4-ZG-1A-2)

During the site visits, there was no important floral and tree species along the roads of the project area. However, many planted trees were identified such as the square shaped trees planted on the road sides. Moreover, Cypress, Eucalyptus and Palm trees were mainly planted as separations along road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta). Different fields of olive and orange trees have dominated along the roads L4-ZG-RD1A-2 (Asnoun – Ain Qroumbech – Zgharta El Zewieh) and L4-ZG-RD1A-3 (Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh) and some fig trees and Cypress trees were observed on these roads respectively. As for

Road L4-ZG-RD-1D (Bchinnine – Kfarchakhna – Kfar Zeina) pine trees and olive trees fields were noticed along this road.

4.2.2 Fauna

Due to the lack of available data on the species of wild animals in the villages of the project area where the roads pass, personal communication was conducted with the Director of Ehden Nature Reserve[10] to identify the various species of animals that exist in the surrounding areas outside Horsh Ehden Nature Reserve as the only data on the fauna in the Zgharta Caza is available for this reserve. The identified species were as follows: Eastern European hedgehog (*Erinaceus europaeus concolor*), Garden crocidure (*Crocidura suaveolens*), Indian Wolf (*Canis lupus pallipes*), Striped hyena (*Hyaena hyaena syriaca*), Lizard (*Lacerta media wolterstorffi*) and the Lebanese viper (*Vipera bornmuelleri*). The lizard and viper species are endemic. In addition, the rare species are the Crocidura and the wolf. While the regionally threatened species are the wolf and the viper. Globally threatened species are the wolf and the hyena.

In addition, information obtained from the Nature Reserve also state that various species of migrant birds, winter or summer visitors, or visitors for breeding purposes are present within the project area including the White stork (*Ciconia ciconia*), the Honey Buzzard (*Pernis apivorus*), the Syriac serin (*Serinus syriacus*), the Barn owl (*Tyto alba*) and the Eurasian eagle owl (*Bubo bubo*). The canary species are limited to the Middle East, while the stork and the buzzard are threatened regionally.

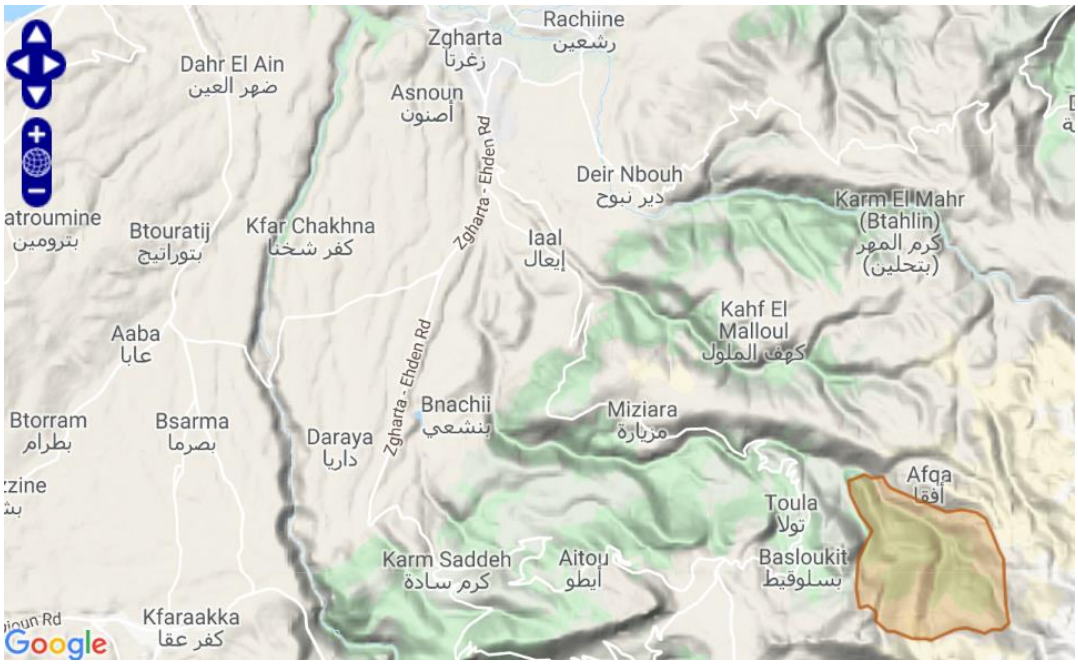
During the site visit, a livestock (cows) farm was observed on the road L4- ZG-RD1A-2 at Asnoun village.

4.2.3 Ecologically Sensitive Areas

The District of Zgharta comprises the Horsh Ehden Nature Reserve declared in 1992 a nature reserve by MOE (MOE, 2006) and declared by BirdLife International in 1994 as an Important Bird Area (IBA) where migration of certain species of endangered birds occurs (BirdLife International, 2019). Figure 4-8 shows the location of the Horsh Ehden Nature Reserve IBA. However, none of the roads in this project are located near or in this IBA. The nearest road (ZG-RD-1D, Bchinnine – Kfarchakhna – Kfar Zeina) is about 10 km away from the IBA and nature reserve (Figure 4-9).

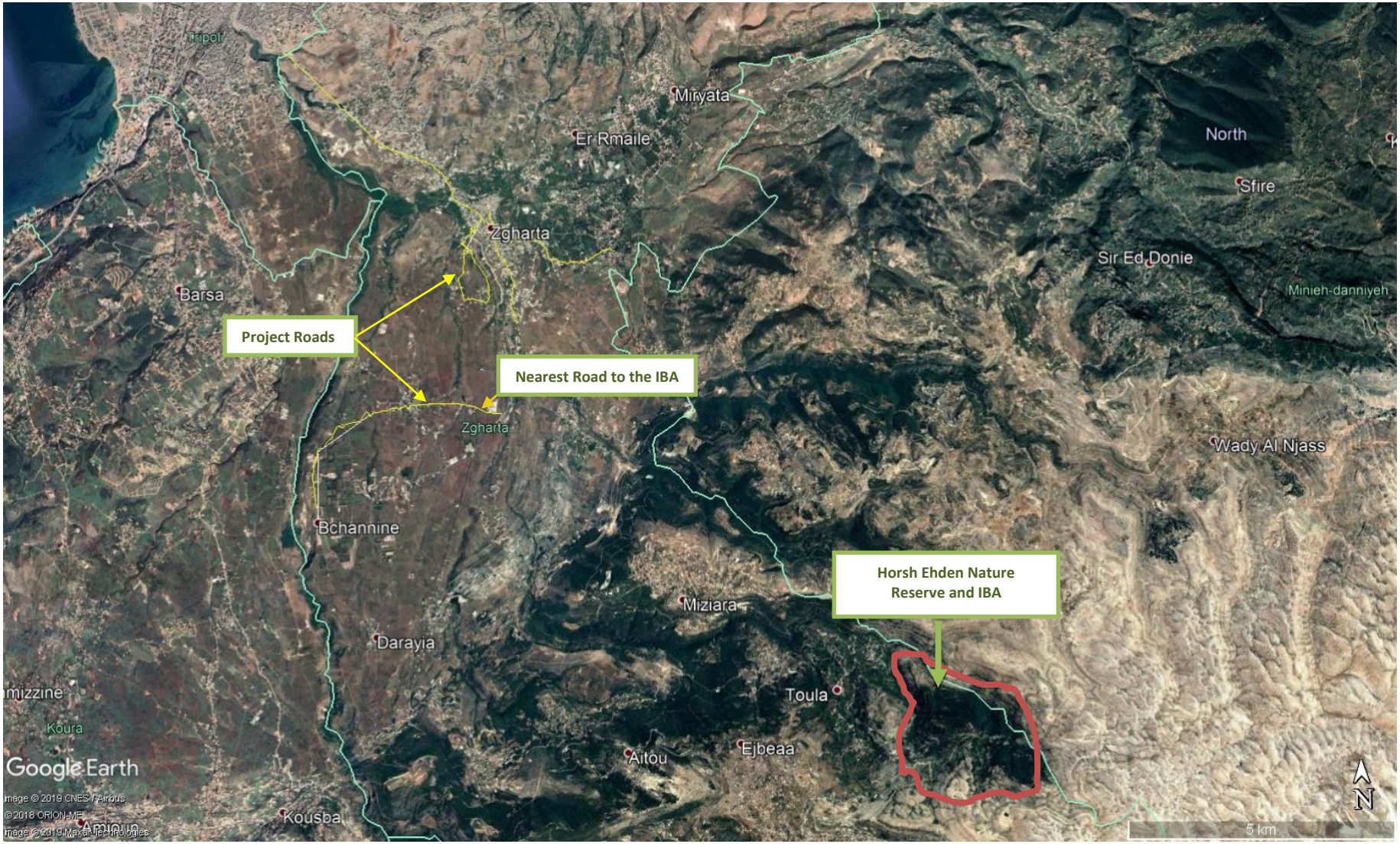
[10] Ms. Sandra Saba on October 12, 2019

Figure 4-8: Location of the Horsh Ehden Nature Reserve IBA



Source: BirdLife International, 2019

Figure 4-9: Project Roads and the Nearest Road in Reference to Horsh Ehden Nature Reserve IBA



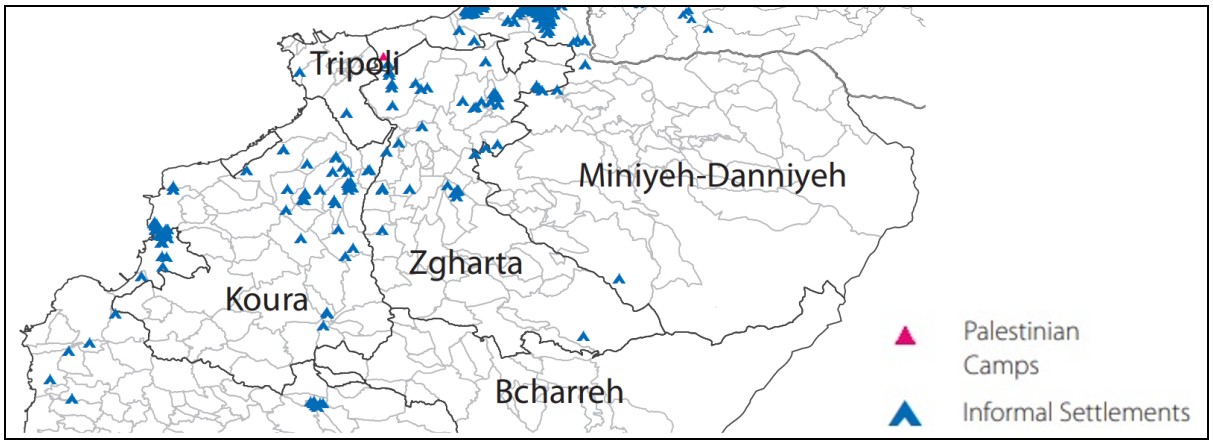
Source: Google Earth, 2019

4.3 Socio Economic Environment

4.3.1 Demographic Profile

The total population registered in the Zgharta District including refugees is 67,575 inhabitants (OCHA, 2016). The population density in the caza is 548 people per square kilometer (IDAL, 2017). According to the Syria Refugee response in the North Governorate, the total number of registered Syrian refugees is 17,000 individuals in Zgharta Caza (UNHCR, 2019). Moreover, there are no Palestinian Refugees in Zgharta and the number of vulnerable[11] Lebanese in Zgharta District is 14,372 out of the total population of 67,575 living in the District (OCHA, 2016), constituting about 21%. Figure 4-10 shows the distribution of the informal settlements of Syrian refugees as well as the Palestinian camps in part of the North Governorate including Zgharta. However, during site visits none of these settlements were observed near project roads.

Figure 4-10: Informal Settlements of Syrian Refugees and Palestinian Camps in Zgharta



Source: OCHA, 2016

The number of the Syrian refugees in each village is presented in Table 4-5, showing that as of end of 2019, the total number of registered refugees in the project area was 7,926.

Table 4-5: Registered Refugees in Each Municipality along the Proposed Roads

Municipality	Number of Syrian Refugees
Mejdlaya	4,594
Ardate	0
Zgharta	1,981
Kfar hata	0
Asnoune	67
Karabeiche	0
Kfar Dalakoss	256
Rachehine	496
Bchenine	151

[11] Classification of "vulnerable" is based on low incomes, lack of access to health, education and water, and poor housing conditions.

Kfar Chakna	85
Kfar Zeina	296
Total	7,926

Source: UNCHR, 2019

The unemployment rate in the caza of Zgharta is estimated at 14.1% compared to the national average of 11.4 % (CAS, 2019). The caza of Zgharta encompassed 14,372 of vulnerable Lebanese (OCHA, 2016) and the unemployment rate is 14.1% (LFHLCS, 2019).However, there are significant differences within this Governorate in terms of poverty as the rates of Zgharta are lower (poverty rate: 24.7%) compared to others in the region such as Tripoli, Minnieh and Dannieh (poverty rate: 55-63%) (El Laithy, H., et al., 2008).

4.3.2 Economic Activities

The economy of North Lebanon relies mainly on services, industry and agriculture. Around 33% of the labor force work in the services sector that includes insurance and financial services. As for industry and agriculture the labor force is 14% and 11% respectively distributed (IDAL, 2018). Zgharta is known for the local crafts professions such as construction, blacksmithing, footwear and cane baskets manufacturing, sewing, and carpentry. However, these professions are fading with time due to the development of technology. As such, Zgharta is currently progressing towards the industrial sector and technology. On the other hand, at present Zgharta is well known for its high-quality production of olive and oil (MedCities, ND). Moreover, there are 545 industrial firms operating in the North Governorate of which 93 are operating in the district of Zgharta (20%) including different companies working in the agro-food sector (IDAL, 2018).

During the site visits, many shops, gas stations, pharmacies and car repairing were identified along the way and are in close proximity to some road stations especially in the residential areas. For example, along road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) there are many shops, two pharmacies, two hospitals, six gas stations, a car repairing shop and a school. As for L4-ZG-RD1A-2 (Asnoun – Ain Qroumbech – Zgharta El Zewieh), the area is urbanized with many small shops and an industrial hangar. L4-ZG-RD1A-3 (Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh) also has minimarkets, furnisher shops and an olive press. Along L4-ZG-RD1D (Bchinnine – Kfarchakhna – Kfar Zeina) there are shops and an industry for concrete blocks manufacturing. This can be found in Annex 1.

4.3.3 Education Services

Zgharta - Ehden account 11 schools, 7 public school and 4 private schools where 3,159 students are registered in public institutions while 1,764 are registered in the private ones. Only one school (Toni Franjieh School) was identified along the road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) (Annex 1).

4.3.4 Health Services

The Caza of Zgharta has an important healthcare asset with many hospitals that serve the whole region (Platau, 2016). The caza of Zgharta includes five hospitals, of which four are private hospitals and one is public. Two hospitals were within the study area and are Al Rahban Hospital and Hospital Saydet Zgharta (Table 4-4). These hospitals are located at around 160 meters and 300 meters away from the road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) respectively In addition, the caza has several health care centers, pharmacies and laboratories (MOPH, 2019), such that the a list of hospitals and their locations can be found in Table 4-6.

Table 4-6: Hospitals in Zgharta Caza

Hospital name	Location	Private/public	Number of beds
Al Rahban Hospital	Majdlaya	Private	46
Centre Hospitalier du Nord	Jdaydeh	Private	52
Ehden Hospital	Ehden Al Midan	Private	18
Hospital Saydet Zgharta	Zgharta al mahhada	Private	55
Ehden Governmental Hospital	Ehden	Public	-

Source: MOPH, 2019

The health care facilities along the project roads are three pharmacies (Station 7+075: Saydet Zgharta Pharmacy in Kfar Hetta, Station 3+400: Mar Charbel Pharmacy in Ardat, Station 4+500: Saint Antoine Pharmacyin Ardat) and two hospitals along L4-ZG-RD1A-1 (Station 2+300: Al Rehben Hospital (closed in Maijdlaya), Station 4+950: Saydet Zgharta Hospital in Zgharta).

4.3.5 Cultural Heritage

Zgharta caza is home for several ancient churches and heritage houses such as the church of Saydet Zgharta (50 m away from road L4-ZG-RD-1A-1, Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) that is considered one of the richest churches in Lebanon whereby it houses the religious scripts and books written by Ehden writers. In addition, in Kfar Zeina there is two ancient monasteries (around 11 km away from road L4-ZG-RD-1D, Bchinnine – Kfarchakhna – Kfar Zeina) namely the Monastery of Saint Qabroanos which was built during the Crusader and the Monastery of Saint Anthony (MoT, 2011). There are no sites of archeological or cultural importance along the project roads. However, three churches are located along the some of the proposed roads, two along road L4- ZG-RD1A-2 (Station 0+050: Saint John Church in Zgharta El Zewieh and Saint Jacob Church at Station 2+420 in Asnoun village) and one on road L4- ZG-RD1A-3 (Station 1+650: Saydet Lourdes in Kfar Dlaqous).

4.4 Summary of Baseline

The proposed roads lie within a range of 62 m to 240 m above sea level. The average annual temperature in Zgharta is 19.4°C with an average annual precipitation of 859 mm. The main geological formation within the study area belongs to the following: Pleistocene (q), Miocene - marly conglomerates and reef limestones (m2), Marl of Neogene (mL), and Pliocene (P). As for the water sources, some of the road sections were either at proximity or cross a river or a water course. A river runs along one of the roads and two streams are located in proximity to two others.

Results of air quality data show that in most cases, concentrations of NO2 in line with WHO standards. As for the concentrations of PM2.5 and PM10, some were not in line with the WHO standards for air quality.

Orchards of orange trees and olive agriculture fields are found along two roads while some cypress trees are planted near households along two others. Another road has palm trees along its separation. Pine trees are also prevalent in the project area.

Densely populated villages within the study area are Ardate, Zgharta, and Kfar Dalakoss. Other villages are relatively moderately populated while others have mostly an agricultural land cover. Furthermore, some livestock farms (cows) were noticed along one of the roads.

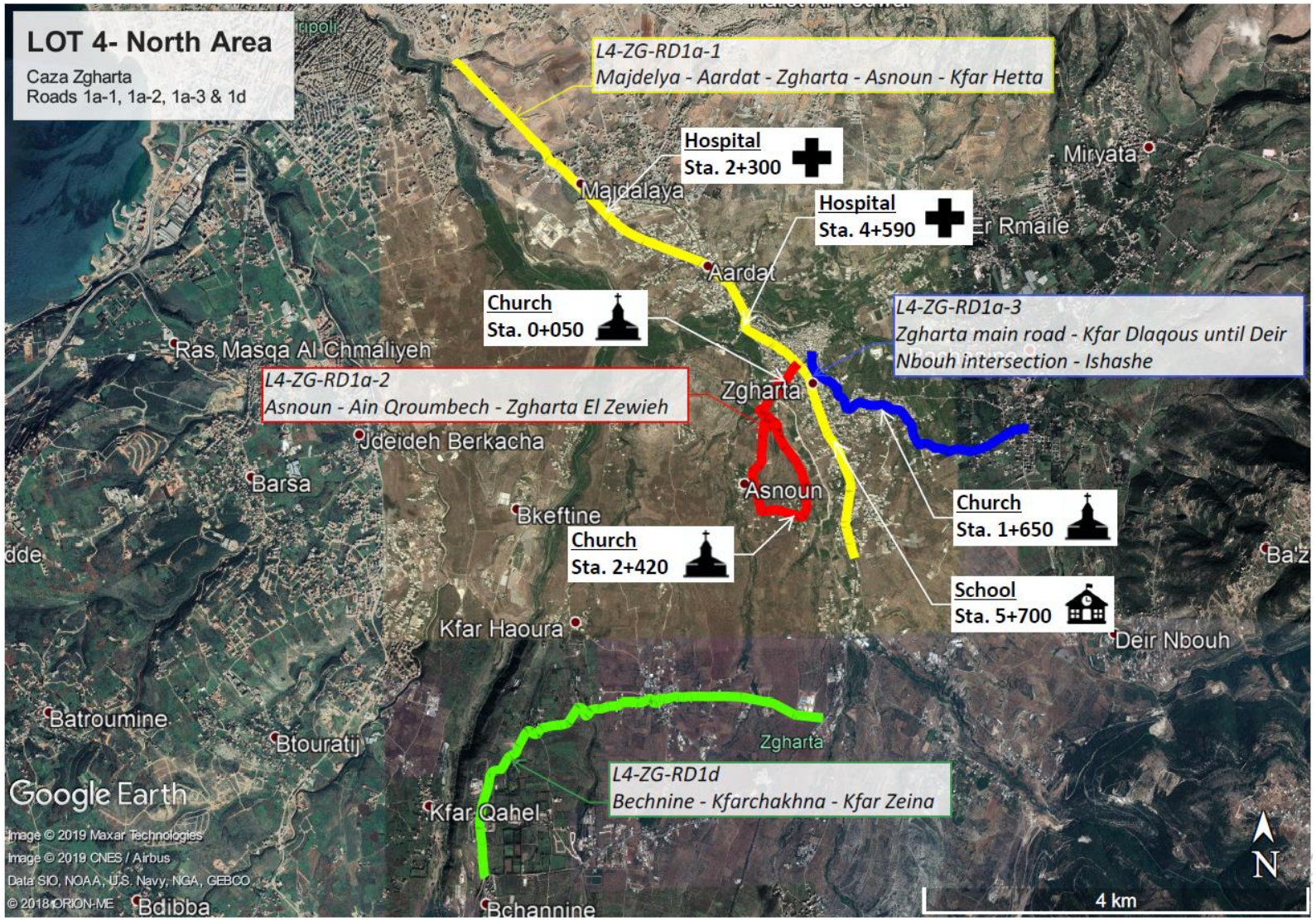
The total resident population in the Zgharta District is 115,053 inhabitants. The total number of registered Syrian refugees is 17,000. The economic activities that exist along the proposed roads included many shops, an industrial hanger, furniture shops, an olive press, an industry of concrete blocks manufacturing, two pharmacies, two hospitals, six gas stations, a car repair shop and a school.

Al Rahban Hospital and Hospital Saydet Zgharta are located within the study area, around 160 meters and 300 meters away from one of the roads,respectively.

There are no sites of archeological or cultural importance along the project roads. However, three churches are located along two of the proposed roads.

Figure 4-11 below and Annex 1 show the exact location of health centers, schools and Churches that are located within the area of the proposed roads.

Figure 4-11: Schools, Churches and Health Care Centers within Project Area



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 in Zgharta Caza.

5.1 Assessment Methodology

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

- Identification of project-related activities (during both rehabilitation/reconstruction and operation phases) and environmental and social 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 Zgharta 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 population. In addition, local garages will benefit from increased business in vehicle and equipment maintenance and residents will benefit from the rent fees of the offices and residences as well as vehicle and equipment parking area. The influx of workers will also increase economic activity in the area as they will likely purchase their daily requirements from the surrounding shops. This will have a ripple effect within the communities where the roads will be rehabilitated. This impact is, however, temporary and jobs will be discontinued as soon as construction works are complete...

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

5.3 Potential Environmental Negative Impacts during Rehabilitation

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

5.3.1 Water and Soil Quality

Contamination of soil, underground and surface water from the rehabilitation of the proposed project might occur as a result of several activities. These include the improper disposal of solid waste and excavated material, inappropriate discharge of liquid waste, wastewater, accidental oil and chemical spillages, and diversion of contaminated rainwater runoff from the project site. One river (Rachiine River) was identified near road L4-ZG-RD-1A-2 at Ain Qrombech village (2 Km) and two streams were identified at proximity of the roads L4-ZG-RD1A-3 at Kfardlaqous village (around 700 m) and L4-ZG-RD-1D at Kfarchakhna village (around 500 m). However, no springs were identified. 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 rivers through runoff.

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

Liquid waste from rehabilitation

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

- Pre-mixed concrete for some small scale activities;
- Excavation road sections that are in sever conditions generating runoffs contaminated with suspended solids, especially during rainy days if the rehabilitation work will start in the fall season;
- Storm water runoff that contains high amounts of suspended solids
- This liquid waste might pollute nearby rivers, streams and soils if not managed properly.

Wastewater

Workers will be needed during the rehabilitation of the proposed roads and its associated works. As such workers will generate wastewater during the entire rehabilitation phase. If the generated wastewater was not managed to be discharged in specific tanks or connected to existing sewage network, nearby surface water bodies might be polluted with high organic loads especially Rachiine River that was identified near road L4-ZG-RD-1A-2 at Ain Qrombech village and the two identified streams at proximity of the roads L4-ZG-RD1A-3 at Kfardlaqous village and L4-ZG-RD-1D at Kfarchakhna village. However, the Contractor will service the site with portable cabin toilet. The porta cabin will be mobile and its placement depends on the length of the work zone. Porta cabin toilet should be link the 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. The collected wastewater should be discharged into the nearest sewerage network or treatment plant.

Accidental Spillage

Water and soil can be polluted as a result of accidental oil spills from the equipment and materials used for rehabilitation of the roads. The spills may occur during re-fueling of oil supplies for machinery generation, as well as using oils and lubricants during operation. Accidental spill of oils may occur and contaminate the underground water resources especially in the case where soil layers are permeable to these materials that could be easily infiltrated. The spills may also affect water quality of Rachiine River and the identified streams during the rehabilitation of the proposed roads (L4-ZG-RD-1A-2 at Ain Qrombech village, L4-ZG-RD1A-3 at Kfardlaqous village and L4-ZG-RD-1D Kfarchakhna village).

Solid Waste Generation

The rehabilitation activities of the roads may generate solid waste from construction materials such cement and their resulting empty bags, electrical wiring, rebar, wood and piles of sand, ruined asphalt and dirt due to excavation. Inappropriate waste handling and improper disposal practices of this type of waste may result in ground and surface water contamination due to leaching and runoffs, hence, reduction in overall water quality. In addition, these materials could be directly discharged into Rachiine River as this river and the identified streams passes through the project area at L4-ZG-RD-1A-2 at Ain Qrombech village, L4-ZG-RD1A-3 at Kfardlaqous village and L4-ZG-RD-

1D Kfarchakhna village. Furthermore, improper disposal of solid waste, inappropriate discharge of wastewater and accidental spills (fuel, oil, chemicals) 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 construction is evaluated as negative (N).

5.3.2 Air Quality, Noise & 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 unpaved surfaces generate particulate emissions such as dust that can affect the local air quality. Fugitive dust emissions could disturb many receptors including workers and the residents of Zgharta especially where the proposed roads passes through residential areas (L4-ZG-RD-1A-1 at Majdelay, L4-ZG-RD-1D at Kfar Zeina and Bechnine). Also some sections of the proposed roads are located near olive and orange groves (at the end of road L4-ZG-RD1A-1, mid of road L4-ZG-RD-1A-2 till the end, all along road L4-ZG-RD-1A-3 and at the beginning of road L4-ZG-RD-1D) (Annex 1). As such, this type of vegetation will be disturbed by the different construction and 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 construction phase. Open burning of solid waste or other material on site could release emissions accompanied by toxins. It is worth to mention that some of the road sections in Zgharta caza require new pavement. At these stations (listed below) the impact on the air quality will be higher than at sections where only patching and overlay is required.

- The road sections in Zgharta Caza that require new pavement are as follows:
- Station 1,300 m – 1,600 m of RD 1A-1 (Majdelya),
- Station 0 m – 1 km 304 m (Asnoun), 3km 500m – 3km 840m (Ain Qroumbech) of RD 1A-2,
- Station 2km 400m – 2km 760m of RD 1A-3 (Zgharta)
- Station 1km 703 m – 5km 100 m of RD 1D (Kfar Zeina, Kfarchakhna and Bechnine).

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 construction phase, the improper storage and disposal of solid wastes and the accidental liquid waste leakages will lead to odor emissions. Thus the generation of odor emissions during rehabilitation is considered a neutral impact (O).
Noise 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 that are populated such as Zgharta, Ardate, Kfar Dalakoss, Rachehine, and Kfar Zeina. Also the generated noise might impact nearby sensitive receptors such as schools and hospitals. For example at road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) two hospitals and a school were identified, thus affecting the students and patients during rehabilitation works. In addition sections of the roads that require new pavement will generate higher noise levels due to the use of more types of heavy machineries than the roads that only require patching or milling and overlay. As such the road sections in Zgharta Caza that require new pavement and that are populated are as follows:

- Station 2km 400m – 2km 760m of RD 1A-3 (Zgharta)
- Station 1km 703 m – 5km 100 m of RD 1D.(Kfar Zeina, Kfarchakhna and Bechnine)

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 construction phase.

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

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

5.3.3 Use of Natural Resources

5.3.3.1 Water Consumption

Water is needed for different processes in the rehabilitation activities. It is needed for concrete mixing, cleaning of tools and the used machinery, dust suppression, and earth works activities. Water consumption in the rehabilitation site may without any conservation measures may lead to overexploitation of water resources. This impact is evaluated as negative (N).

5.3.3.2 Natural Material Sourcing

The proposed project requires the use of borrow material such as aggregates and sand, whose amount and volume will be determined by the contractor. As such, the excavation of lands for the extraction of borrow material may result in removal of land resource. This leads to the change in the morphology of the land. Also in some cases the change might be sever 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 no illegal quarries will be used by local contractors to provide the project with the required borrow material.

5.3.4 Land Cover

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

5.3.5 Biological Environment (Flora and Fauna)

As mentioned in Section 4.2.5, during the site visits, many trees were observed such as the Cypress trees, palms and Eucalyptus trees that were planted as road separations. However, these trees are not expected to be affected directly as no trees will be removed during project rehabilitation. In addition, the olive and orange orchards that dominate most of the project area will also not be affected by the rehabilitation activities as none of these trees are located on the road sides but are planted in lands at proximity but outside the road delimitations. Moreover, pine trees scattered along the roadsides (L4-ZG-RD-1D, Bchinnine – Kfarchakhna – Kfar Zeina) have been planted on the roadsides near private lands and will not be affected by the project activities.

In addition, the main rehabilitation activities that may have a negative effect on the study area flora are the activities of heavy machinery movement on unpaved roads and removal of deteriorated asphalt layers. However, the tree species mentioned above were observed away from the road alignment (3m-5m). As such the dust generated from these activities will not have a significant impact on the flora in the project area. It is worth to mention that the rehabilitation phase is a short-term phase (15-18 months) and the impacts of such activities will disappear as soon as the work is completed.

Due to its low significance and short-term nature, the impact of the construction and rehabilitation activities is therefore assessed as neutral (O).

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

5.3.6 Visual Intrusion

As mentioned previously this project will not change the landscape of the area since the roads already exist. However, the project contractor will try to the extent possible to prevent visual intrusion for nearby people due to the presence of heavy equipment and machinery 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 belowground 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 a neutral impact (O).

5.4 Potential Socioeconomic Impacts during Rehabilitation

5.4.1 Labour Influx

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

5.4.2 Social Tension

Social tensions may arise between local and displaced communities should the former perceive that most the job opportunities created are being offered to foreign workers. 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. This impact is considered to be negative (N).

5.4.3 Child Labor

During construction, 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).

5.4.4 Traffic and Accessibility

As a result of the proposed rehabilitation activities, on site traffic management may pose a challenge on the proposed roads. Moreover, the movement of heavy machinery and construction activities may lead to temporary traffic jam or might result in accidents and cause inconvenience to the people using those roads. In addition, traffic could be disrupted by the rehabilitation activities throughout traffic diversions, detours or blockage. Also detours might increase the traffic patterns at these roads especially in urban areas. As mentioned before, the location of these detours will be specified by the contractor during the rehabilitation phase. Also during the rehabilitation activities, some of the trade and supply flows of goods will be disturbed in the project area and women might be affected from the presence of rehabilitation activities and workers along the proposed roads. Women might not be able to perform their routinely outdoor activities. However, these impacts are temporary and will vanish as soon as the project is completed. As such, this impact is assessed as a negative impact (N).

5.4.5 Cultural Heritage

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

5.4.6 Economic Activities

As mentioned previously, many shops, markets, snacks, and car repairing were identified along the way and were in close proximity to some road stations especially in the residential areas. For example, along road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) there are many shops, two pharmacies, two hospitals, six gas stations, a car repairing shop and a school. As for L4-ZG-RD1A-2 (Asnoun – Ain Qroumbech – Zgharta El Zewieh), the area is urbanized with many small shops and an industrial hangar. L4-ZG-RD1A-3 (Zgharta main road – Kfar Dlaqous until Deir Nbouh Intersection - Aashesh) also has minimarkets, furnisher shops and an olive press. Along L4-ZG-RD1D (Bchinnine – Kfarchakhna – Kfar Zeina) there are shops and an industry for concrete blocks manufacturing. This can be found in Annex 1. During the rehabilitation phase, these shops might be affected due to potential road closure, presence of excavation activities and heavy machinery near those shops. Thus, this will impact the livelihood of the shops owners. This impact is therefore considered negative (N) and temporal as the livelihood will be enhanced once the road is rehabilitated.

5.5 Potential Health and Safety Impacts

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

- Acute respiratory disorders, lung and heart diseases due to the generation of particulates from vehicular emissions and constructional machinery that operates on fuel as well as silica in dust from the earth agitated by heavy machinery on unpaved roads.
- Acute irritation of the upper airways resulting in coughs and cold from large particulates.
- Acute manifestations including inflammatory conditions like bronchitis, bronchiolitis and pneumonia which may be rapidly fatal from the inhalation of small size particulates (2.5u to 10u).
- Pollutants such as 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 area associated with the generation of dust includes irritation of mucous membranes or allergic reactions that might be harmful to the eyes and skin (GoG-MRH, 2017).

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, 2007).

Thus occupational health and safety impacts for the workers and nearby residents are evaluated as a strongly negative impact (2N).

5.5.2 Community Health and 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. Also special care must be taken into consideration during the rehabilitation phase near schools and hospitals as students and patients might be affected from several civil works. Also the generated noise might impact nearby sensitive receptors such as schools and hospitals. For example, at road L4-ZG-RD1A-1 (Mijdlaya – Aardet – Zgharta – Asnoun – Kfar Hetta) two hospitals and a school were identified. 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, the rehabilitation of roads will like slightly contribute to the improvement in access to education and healthcare facilities especially for women and children and it will benefit from the new business opportunities. It is also expected that the proposed road rehabilitation project will increase the land values in nearby villages.

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

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

5.6.1.2 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 5.7.7.

5.6.2 Cultural Heritage

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

5.7 Potential Negative Environmental Impacts during Operation

5.7.1 Water and Soil Quality

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

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

5.7.2 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. 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. Consequently, 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 situation as the road and this impact already exist.

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

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

5.7.6 Visual intrusion

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

5.7.7 Traffic and Road Safety

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

5.8 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 possible open burning activities	Air, nearby communities and workers	N
Dust pollution from rehabilitation and excavation activities	Air, nearby communities	N
Noise pollution a result of transportation or delivery of raw materials, trucks movement, concrete mixing, drilling, construction and operation of heavy vehicle movement such as excavators	Nearby communities and workers	N
Disturbance of nearby areas and animal escape from noise and vibrations	Biodiversity and sensitive habitats	N
Contamination of surface water from improper disposal of wastewater from workers, water coming from cleaning of machines and equipment Reduction in overall surface water quality due to improper disposal of construction waste Water pollution due to accidental spill of oils and chemicals	Water resources, soil, nearby communities	N
Contamination of soil from accidental spills of oils and chemicals on the soil from machines and trucks and from transportation of chemicals and oils	Soil, subsoil and land	N
Improper disposal of cut volume may cause contamination of water bodies in rainy weather	Water resources	N
Surface water and soil pollution from improper disposal of solid waste generated from workers and the used materials, construction waste from excavation and drilling activities	Water resources, soil, subsoil and land	N
High consumption rates of electricity, fossil fuel, etc. contributing to overconsumption and depletion of fuel	Energy resources	N
High consumption rates of water for construction related activities	Water resources	N
Over extraction of borrowing material and depletion of natural resources (sand, aggregates, …)	Soil, subsoil and land	N
Tree and floral species disturbance near the site during rehabilitation activities	Biodiversity and sensitive habitats	O
Disturbance of animals in the area	Biodiversity and sensitive habitats	N
Potential damage to existing infrastructure	Existing infrastructure and nearby communities	O
Socioeconomic		
Creation of job opportunities for local communities	Labor influx, socio-economic activities	P

Impact	Media	Nature
Local garages will benefit from the equipment oil maintenance and residents will benefit from the rent fees of the offices and the equipment parking area.	Nearby communities, socio-economic activities	P
Discrimination from the local community against the foreign workers	Foreign Workers	N
Social tensions as a result of perception that foreign workers being offered a major proportion of the jobs created by the project	Local and foreign workers	N
Child labor for construction activities	Local and foreign children	2N
Traffic congestion in the concerned towns due to transport of construction materials, the material that may fall or due to temporal road closure	Nearby communities, socio-economic activities	N
Potential occurrence of sexual abuse and exploitation incidents	Nearby communities	N
Disruption of local community to access services due to construction activities and temporary road closure	Nearby communities and socio-economic activities	N
Disruption to access to shops, schools and hospitals as a result of construction activities and temporary road closure thus affecting livelihood of shop's owners	Shop's owners	N
Community and Occupational Health and Safety		
Material falling from vehicles during transport may cause traffic accidents or congestion	Nearby communities	N
Accident and injuries to workers because of construction activities (mainly respiratory health risks)	Workers	2N
Dust generation and noise may cause health related problems to nearby residents	Nearby communities	N
Injuries from car accidents due to the presence of construction sites and closure of some roads	Nearby communities	N

Table 5-3: Summary of Impacts during Operation Phase

Impact	Media	Nature
Environmental		
Increased vehicular pollutant levels in the area causing public health risks and other impacts on the environment	Air, Nearby communities	N
Noise pollution from traffic related noise pollution; vibrations from engines and tires and use of pressure horns disturbing wildlife and nearby residential areas	Nearby communities, biodiversity and sensitive habitats	N
Depletion of natural resources (fuel) used for street lighting purposes	Energy resources	N
Disruption of animals movement leading to direct mortality or avoidance behavior as a result of increased traffic load in the area	Biodiversity and sensitive habitats	N
Possible oil spills events transported through runoff and polluting nearby surface and groundwater bodies	Water resources, soil, subsoil and land, nearby communities	O
Socioeconomic		
Encouragement of new business	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 Occupational Health and Safety		
Accident occurrence due to the enhancement of vehicular movement resultingfrom the improvement of road conditions	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 bodies and avoid working in rainy weather. Also the contractor should ensure that the volume of the removed deteriorated asphalt will be disposed properly during the rehabilitation phase in controlled disposal sites to be identified by the contractor in coordination with the relevant municipality. As for the domestic 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 sewerage network or operational wastewater treatment plants, which should be identified by the contractor. In addition, the discharge of wastewater into nearby water bodies should be prohibited under any condition.

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 for during rehabilitation should be regularly maintained;
- Open burning of solid waste must be prohibited;
- Vehicles must move at a low speed on unpaved roads 20-30 km/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 residential (Zgharta, Ardate, Kfar Dalakoss, Rachehine, and Kfar Zeina) and sensitive areas (Toni Frangieh School, Al Rahban Hospital and Saydet Zgharta Hospital of road L4-ZG-RD1A-1), 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.
- Proper communication and coordination with affected municipalities and robust GRM in place

6.1.4 Use of Natural Resources

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

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

6.1.5 Land Resources and Biological Environment

The following mitigation measures must be implemented in order to minimize the impacts on the fauna in the project area:

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

6.1.6 Visual Intrusion

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

- All sources of light must be shut down during nighttime 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.

6.1.8 Access to Services

In order to avoid any disruption on access of services that may exist along the roads, regular coordination with relevant municipalities and authorities should be done by the contractor. In addition, the following measures are recommended:

- Inform public about schedule of rehabilitation
- If possible, restrict the period of rehabilitation works in Zgharta village during summer as most residents reside in Ehden during this period

6.2 Environmental Mitigation Measures during Operation

6.2.1 Water and Soil Quality

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

6.2.2 Air Quality

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

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

6.2.3 Noise

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

6.2.4 Use of Natural Resources

In order to reduce the impact on natural resources, cleaning activities that require a large amount 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:

- Ensure the installation of warning 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.
- Ensure that trees are planted on the roads sides as a fence to prevent the collision between animals and the passing vehicles.

6.2.6 Visual Intrusion

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

6.3 Social Mitigation Measures during Rehabilitation

6.3.1 Socioeconomic

6.3.1.1 Economic Activities

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

- Warn the staff strictly not to involve in any unethical activities and to obey the local standards and cultural norms
- Select specific timings for the construction activities especially near residential areas in accordance with MOE Decision 52/1 for 1996 (National Environmental Quality Standards).
- Ensure that the generated solid waste and liquid waste is disposed or discharged of in an environmentally friendly way and in selected areas.
- Clear selection criteria and fair allocation of job opportunities
- Non-discrimination and fair treatment (such as equal wages/benefits and contractual working conditions) should be also ensured among workers

Moreover, as mentioned earlier, the owners of the identified shops within the project site will be affected during the rehabilitation phase. Some mitigation measures must be implemented during this phase to minimize this impact such as:

- Install wooden structures from the road to the shops
- Proper installation of sign boards

- Timely completion of the rehabilitation phase
- Proper communication and coordination with affected municipalities and robust GRM in place

6.3.1.2 Labour Influx

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

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

6.3.1.3 Social Tensions

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

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

6.3.1.4 Child Labor

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

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

6.3.1.5 Traffic and Accessibility

The following mitigation measures must be implemented in order minimize the traffic congestion and resident's inconvenience during the rehabilitation of the roads and not to disturb the routinely activities of the local community including women, students and traders:

- Inform the local community about the location of detours, road blockages or diversions and schedule of rehabilitation work 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 not to disturb the routinely activities of the local community including women, students and traders;
- Install proper warning signs;
- 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 that traffic is managed properly near hospitals and schools
- Access to hospitals should not be impeded at no time

6.3.2 Cultural Heritage

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

6.4 Community and Worker Health and Safety

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 construction phase in order to avoid the exposure to flying particles or harmful chemicals.
- Workers should wear the right gloves to protect their hands. Different type of gloves could be used according to the undertaken construction activity.
- Boots with slip-resistant and puncture-resistant soles should be worn by the workers on construction site
- The contractor should abide by the assigned work schedule (OSHA, 2011)

In addition, in order to minimize the occupational health risks, the following mitigation measures must be implanted 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-, 2007)

In addition, effective Occupational Health and Safety Plan for construction should be prepared and implemented and include at least the following components:

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

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 residents' safety and passers-by should be ensured. 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 and hospitals) 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 construction schedule and abide by assigned timing
- Install pedestrian and vehicular passages near residential areas
- Accidental oil spillage shall be well controlled
- Installing a base course layer on the road near agriculture areas in Mejdlaya
- Add speed bumps to slow traffic in front of all sensitive receptors (schools, religious buildings, health facilities).
- Reach out to the women and inform them about the upcoming work schedule
- Develop a site-specific Public Health and Safety Plan and Occupational Health and Safety
- Apply Best Applicable Practices on Road Safety
-

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 road.

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.

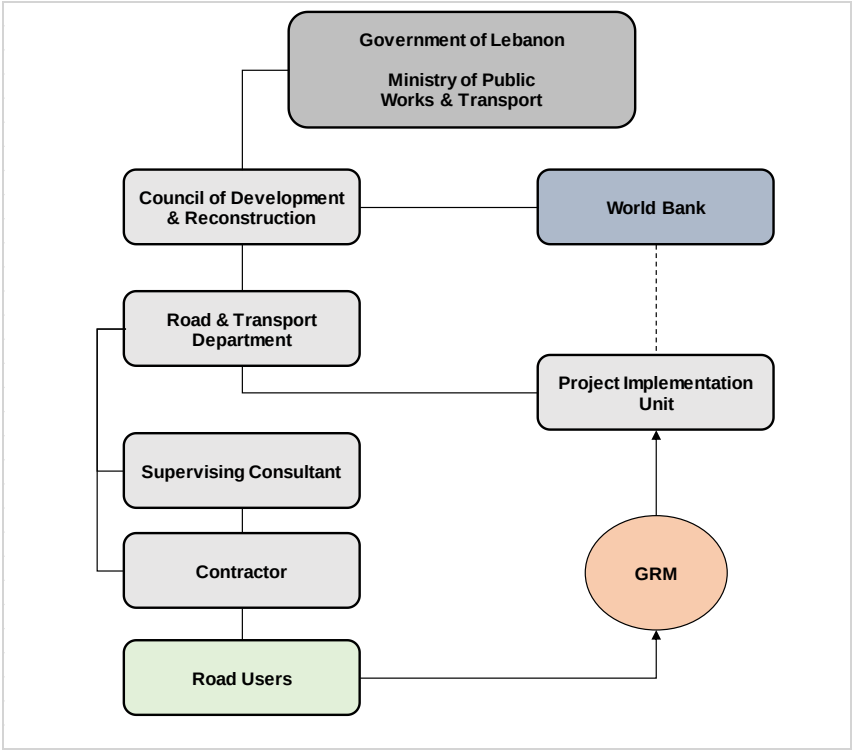
In order to achieve proper environmental and social management and monitoring, a clear, functional institutional structure was defined (refer to Figure 7 1). During the rehabilitation phase, the contractor would be the primary actor; ensuring compliance of works with the different items specified in 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 plan direction, technical support, appraisal and validation of environmental and social management plans, and monitoring of environmental compliance and progress reporting to the World Bank. The responsibility of implementation and management of environmental/social safeguards by the PIU will be coupled with the assignment of supervising consultant (focal point(s) for environmental and social safeguards) who will oversee the ensuring sound application of the ESMP. Finally, implementation of the ESMPs will mainly be the Supervising Engineer duty and consequently the Supervising Engineer will have to appoint qualified environmental, health and safety consultant and a social development consultant in order to ensure that the Contractor is compliant with the ESMPs during the rehabilitation phase of the project.

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

Figure 7-1: Roads and Employment Project Management Structure



7.1.2 Training

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

The main objective of the training is to:

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

Training programs must be incorporated with a feedback loop to ensure their relevance and acceptance by staff and will be reviewed periodically and updated when necessary. The implementation of the training programs will raise awareness to the involved municipalities (Mejdlaya, Ardate, Zgharta, Kfar Hata, Zgharta, Asnoune, Karabeiche, Kfar Hata, Kfar Dalakoss, Rachehine, Bchenine, Kfar Chakna, Kfar Zeina and Al-Jdeidé) of the Caza in the following topics:

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

- Emergency response and chemical spills;
- Sampling techniques and environmental monitoring guidelines;
- Risks associated with road conditions, lack of safety measures and signage;
- Pollution health impacts and prevention measures;
- Operating procedures on the rehabilitated roads (Incident Reporting and Investigation);
- Grievance Redress Mechanism (GRM)
- Sexual Exploitation Abuse and Sexual Harassment
- 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 construction and operation phases respectively. The plan for the construction phase should be included in the contractor's tender documents to ensure that all requirements have been taken into consideration by them and will be implemented during the construction phase.

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

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated cost
Construction	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	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	Prepare and abide by a Spill Prevention & Management Plan	Contractor	Supervision Engineer	5,000 $

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated cost
	chemicals from trucks and from transportation of chemicals and oils Improper disposal of cut volume may cause contamination of water bodies in rainy weather	Used oil from occasional maintenance of machinery or chemicals must be stored in an appropriate area until it's collected and disposed in controlled disposal sites Minimize soil exposure time Proper storage of raw material including chemicals and fuel and handling must be on a paved and sealed floor Regular maintenance of vehicles Minimize the use of chemicals Reuse of excavated material whenever possible Disposal of excavated material in controlled disposal sites			
	Contamination of soil and surface water bodies from the improper disposal of solid waste generated from workers and the used materials, construction waste from excavation and drilling activities	Proper disposal of construction waste in controlled disposal site to be identified by the contractor in coordination with the relevant municipality Proper waste management practices Reuse or recycle the generated waste whenever possible Reuse of excavated material whenever possible Disposal of excavated material in controlled disposal site sites to be identified by the contractor in coordination with the relevant municipality Train workers on waste reduction procedures	Contractor	Supervision Engineer	1,500 $
	High consumption rates of electricity, fossil fuel, etc. contributing to overconsumption and depletion of fuel	Maintenance of the generators and trucks Light in the site offices shut down during the night Construction workers must be trained and provided with awareness sheets on efficient energy use Machinery and equipment must be turned off when not in use	Contractor	Supervision Engineer	5,000 $
	High consumption rates of water for construction related activities Reduction in overall ground	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	Contractor	Supervision Engineer	5,000 $

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated cost
	and surface water quality due to improper disposal of construction waste	Training and awareness should be raised to workers concerning water usage best practices and water conservation Proper disposal of construction waste			
	Depletion of natural resources due to the unsustainable extraction of borrowing material (sand, ,aggregates, …)	Ensure that the borrow material are extracted from legal sites Avoid agricultural lands to extract borrowing material In case extraction was done from agricultural sites, store the top soil layer for future rehabilitation Rehabilitate the site where excavation was done	Contractor of the quarry site	Supervision Engineer	
	Socioeconomic Impacts				
	Temporary Labour Influx	Priority hiring to qualified local community GRM for local communities	Contractor	Supervision Engineer	-
	Economic Activities and its effect on the livelihood of the shops owners	Install overpass structures from the road to the shops Proper installation of sign boards Timely completion of the rehabilitation phase	Contractor	Supervision Engineer	-
	Discrimination from the local community against the foreign workers	Conduct awareness campaigns for the local community regarding foreign worker influx Inform the local community that worker will sign code of conduct before stating the work GRM for local communities and all relevant stakeholders	Contractor	Supervision Engineer	-
	Possible unequal wage benefits between local and foreign workers	Ensure that all workers (locals and foreign, skilled and unskilled) shall be compensated equally as per the scale of market price rates, have equal contractual benefits and contractual working conditions, and have access to GRM	Contractor	Supervision Engineer	-
	Possible recruitment of children who are under the legal age as workers on the site, especially in the case of the day laborers	Daily registrations of workers and verification of their age to prevent child labor Abide by the Labor Law Ensure the contractor is aware of the penalties that Labor Law imposes in the case of child labor	Contractor	Supervision Engineer	-

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated cost
		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 due to construction activities and temporal road closures	Traffic shall be secured via alternative routes to reach relevant destinations in case the works imply the temporary closure of this road Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage GRM for surrounding communities	Contractor	Supervision Engineer	-
	Destruction of existing infrastructure	Regular coordination with relevant municipalities	Contractor	Supervision Engineer	-
	Potential occurrence of sexual abuse and exploitation incidents	Draft Codes of Conduct and the guidelines for a GBV and VAC Action Plan All workers should sign codes of conduct written in their native language Respond to the reported incidents of sexual abuse exploitation as a matter of priority Training on gender-based aspects, internal and external GRM	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 Cover transported material Abide by traffic regulations Operate well maintained vehicles	Contractor	Supervision Engineer	1,500$
	Traffic congestion in the town due to temporal road closure				
	Material falling from vehicles during transport may cause traffic accidents or congestion				
	Community and Occupational Health and Safety				
	Accident and injuries to	Workers to wear proper safety gear (PPE)	Contractor	Supervision	3,000 $

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated cost
	workers and public because of rehabilitation activities Dust generation and noise may cause health related problems for workers and disturbance to residents	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 Proper safety and diversion signs must be installed at sensitive areas (i.e. near schools and hospitals) 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 Develop a site-specific Public Health and Safety Plan and Occupational Health and Safety Apply Best Applicable Practices on Road Safety		Engineer	
Operation	Environmental Impacts				
	Increased vehicular pollutant levels (CO, NOx, SOx, PM_{10}) in the area causing public health risks and other impacts on the environment.	Ensure that the road is regularly maintained to ensure good surface conditions Frequent air quality monitoring must be done along the roads area to ensure that ambient air quality parameters are within the standards	Local authorities	-	3,000 $
	Noise pollution from traffic related noise pollution; vibrations from engines and tires and use of pressure horns disturbing wildlife and nearby residential areas	Installation of signs near sensitive areas to prevent people from using the pressure horns	Local authorities	-	4,500 $
	Disruption of animals movement leading to direct mortality or avoidance behavior as a result of increased traffic load in the area	Install speed limit and animal crossing signs at areas were animals cross the roads	Local authorities	-	2,500

Project Activity	Potential Impact	Proposed Mitigation Measures	Responsibility of Mitigation	Responsibility of direct supervision	Estimated cost
	Community and Occupational Health and Safety				
	Increased traffic, accidents rates and risk on pedestrians	Apply Best Applicable Practices on Road Safety	Local authorities	-	1,500

7.3 Monitoring Plan

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

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

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

7.3.1 Monitoring Plan Implementation

To ensure implementation of the plan during construction a Health, Safety and Environmental Officer should be appointed on site by the Supervision Engineer at all times and at all the locations of the sensitive receptors that were presented in Figure 4-11.

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

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

- Code of conduct trainings and number of signed forms
- Dates of trainings
- Mitigation measures undertaken.
- Title and dates of training programs

After documenting, the supervision engineer must submit the reports to the CDR and the WB on a quarterly basis. In addition, immediate reporting should be made to CDR after any severe incident, such as a fatal accident.

7.3.2.2 During Operation

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

7.3.3 Guidelines for Health and Safety Plan during Rehabilitation

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

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

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

Table 7-2: Environmental and Social Monitoring Plan

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
Rehabilitation	Environmental Impacts						
	Air pollution (Dust /GHG Emissions)	• volume of dust • 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 complain	Throughout the project area near sensitive receptors	Single sample per location (average 1hr reading-15 min intervals) during morning (7-8am), evening (1-2pm) and night (4-5pm)	$300 (cost of noise monitoring machine)

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	Contamination of surface water bodies and soil from the generated domestic wastewater from workers and liquid waste from rehabilitation activities	• Check for leakages in the connections between the porta cabin toilets and the existing network or polyethylene tank • Check the discharge endpoint of the pumped wastewater from the polyethylene tank • Effluent from construction activities (Concrete mixing, dust minimizing, washing of equipment…)	Supervision Engineer	Weekly	Throughout the project area and at the porta cabin toilet sites	Visual inspection	-No Cost
	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	-

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	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	-
	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		-
	Socioeconomic 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	-

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	Labor conditions	• Proportion of Lebanese versus Syrian workers • Worker's age • GRM log • Attendance sheets to GBV trainings • Number of workers trained to SEA • Number of workers who signed Code of Conduct	Supervision Engineer	Monthly			
	Labor Influx	• Number of report Sexual abuse and exploitation (SEA) incidents	Supervision Engineer	Monthly			
		• Number of inappropriate communication and language among the workers	Supervision Engineer	Monthly			
	Community and Occupational Health and Safety						
	Accident and injuries to workers	• Ensure signs are in place before works begin • Visual inspections to ensure that all workers are wearing their PPEs • Recorded injuries and accidents within the workers	Supervision Engineer	Daily	Along the proposed roads	Visual inspection Accidents records	-
	Accident and injuries to the	• Ensure the installation of	Supervision Engineer	Daily	Along the proposed roads	Visual	-

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
	public	pedestrian and vehicular passages near residential areas • Ensure road diversion and construction attention signs are in place before works begin • Ensure the development of a site-specific Occupational and Public Health and Safety Plan and that the best practices are applied • Record injuries and accidents within passers-by				inspection Accidents records	
Operation	Environmental Impacts						
	Air pollution (dust emissions)	• Total Suspended • Particles (TSP), PM10, • PM2.5 (wherever feasible), SOx, NOx and CO	Local Authorities	Annually	At main receptors along the proposed roads	1-hr and 24-hrmeasurements, and visual observation of dust dispersion(scale and direction)	$1,500/ event
	Noise pollution	• Leq, Lmin and Lmax	Local Authorities	Bi-Annually	At main receptors along the proposed roads	Single sample per location (average1hr reading-15minintervals)	$300 (price of machine)

Project Activity	Impact	Monitoring Indicators	Responsibility	Frequency / Duration	Location	Methods	Estimated Cost
						during morning (7-8am),evening (1-2pm) and night (4-5pm)	
	Community and Occupational Health and Safety						
	Car accidents	• Number of car accidents • Cause of accidents • Location of accidents	Local Authorities	Annually	Along the proposed roads	Records of car accidents, cause of accidents and location of accidents	-

8. CONSULTATION, DISCLOSURE AND GRM

8.1 Public Consultation

A public hearing was held at the municipality of Zgharta on Saturday, 12 October 2019. The purpose of the hearing was to inform the public and relevant stakeholders and NGOs about the proposed project that will rehabilitate 4 roads in Zgharta Caza and their accompanying infrastructural works and to take into account their concerns and feedback to inform the project design.

The hearing was organized d in coordination with CDR and the municipality of Zgharta 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 preliminary findings of the study and obtained feedback of the participants in order to include in the report. -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. Additional details can be found in point c of this Section.

Fourteen people participated in the meeting including 4 women, one of them working in the municipality of Zgharta and responsible for the municipality's activities and tourism, one woman is the director of a public school, another was an agriculture engineer and the director of the Ehden Nature Reserve and another women is a director of a NGO mainly a cultural women organization.

During the session, the public proposed to install physical obstacles to force deceleration (rumble strips) and sidewalks in that area to ensure public safety and the importance of the continuous coordination with the municipalities throughout the rehabilitation phase. As for the impacts that might result from the rehabilitation of roads, the public does not see any major environmental, health and safety concerns.

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

- They believe the project will contribute positively to improving women's participation in supplying food to the workers and catering services. Moreover, job opportunities could be available for locals.
- There must be a clear coordination mechanism with the municipalities and other authorities during the rehabilitation phase to quickly address potential problems such as burst water or wastewater pipe.
- They believe that the period of the rehabilitation phase must be implemented during summer where there are no schools and most of the residents are in Ehden.

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

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

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

Local NGOs were invited to the public hearing that was held at the municipality of Zgharta on Wednesday, 12 October 2019. Table 8-1 represents the name of the invited NGOs and their field of activity. Those local NGOs may play a role in bringing pressure against contractors when needed.

They also serve as advocates to reduce projects' social and environmental risks and promote good practice.

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

Name of the NGOs	Activity
Rene Mouawad Foundation	Improving education, economic empowerment, provision of social and health care, and the promotion of democratic values to the most marginalized and needy communities throughout Lebanon.
Oummal Association	Oummal works on improving the living of each community member and specially the vulnerable. It does so by empowering the role of the government, believing in the capacity of each community member, and helping community members know their rights.
Al Midan Association	The program targets the municipalities in the North Governorate to enhance good Governance and overcome social issues
Lebanese Association for Mines and Natural Disaster Action	Their mission is to alleviate the impact of wars, man-made and natural disasters on victims and affected populations
Social Center for Orphans and Widows	Children, Family, People, Women, Youth
Association Of Protection Support and giving	Children, Family, People, Women, Youth

b) International NGOs: they are covering the whole country and their consultation will be applied to all the ESMPs of the REP. They provide relief and developmental aid to many developing countries. They support the society in responding to crises and helps people whose lives and livelihoods are shattered by conflict and disaster to survive, recover and gain control of their future. When the crisis in Syria erupted in early 2011, numerous International NGOs responded to the humanitarian crisis and worked directly with the Syrian in Lebanon by providing aid and responding to their critical situation.

This ESMP consulted International NGOs (see Table 8-2) to inform them about the Project, disseminate it, ask them to circulate its impacts and activities among Syrian and tell them that they can inquire about additional information and/or submit a complaint (if any) by contacting the Grievance Redress Mechanism (GRM) Unit on 01980096 ext:317 or send an Email to rstephan@cdr.gov.lb or register by hand an official letter at the CDR .

In Zgharta Caza, the total number of registered Syrian is 17,000 individuals (UNHCR, 2019). They were contacted through the International NGOs to seek their feedback about the Project. Accordingly, this ESMP did not receive any concern about the Project.

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

NGO Name	Contacts	Intervention Sector(s)	Comments
			substantially to cope with the Syrian crisis. they have six offices throughout Lebanon. She welcomed the idea of the Project and will disseminate it across her organization.
ACTED	Mr. Jack French Deputy Country Director T: 01324331 M: 79160375 E: jack.french@acted.org	• Development • Infrastructure & Services Rehabilitation • Labor & Livelihoods • Shelter • Water sanitation and hygiene	Mr. French received the Project information sheet and explained that ACTED is working with Syrian in Beirut and northern districts of Mount Lebanon (Baabda, Metn, Keserwane and Jbeil), as well as in Akkar District. He welcomed the idea of the Project and will disseminate it across his organization.
Danish Refugee Council (DRC)	Mr. Rickard Hartmann Country Director T: 01339052 (ext: 201) E: rickard.hartmann@drc.ngo	• Direct Assistance • Protection • Shelter • Community Empowerment and Livelihoods	Mr. Hartmann received the Project information sheet and explained that DRC is working with Syrian on many sectors in different locations across Lebanon including Beirut, Tripoli, Kobayat and Zahle. He welcomed the idea of the Project and will disseminate it across his organization.

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. Anonymous grievances

will be addressed in both levels and the maximum anticipated time needed to close a GRM case is 45 days.

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8.2.1 GRM for Communities

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

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

- Level 1: If any person has any complaint, concern or suggestion regarding the project implementation, he or she can lodge an oral or written grievance through e-mail (GRM.REP@cdr.gov.lb), phone call or text message (01980096 ext:317), or website link (http://www.cdr.gov.lb/study/RoadsEmp/RoadsEmp.htm) to the site engineer or manager of the roads to be rehabilitated in Zgharta 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 PMU, he or she can bring the complaint to the attention of the PMU 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.
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Meanwhile, it is recommended that the aggrieved party is consulted and be informed of the course of action being taken, and when a result may be expected.

Moreover, reporting of the complaints to the PMU should be done on a monthly basis except for urgent cases. The designated person at each level should report to the PMU on the number and subject of new complaints received, and the status of the already existing complaints, if any. The report should also inform the PMU of complaints that could not be resolved at the lower levels and are being elevated to the PMU Director's attention. The PMU aggregates information received into a status report each quarter, indicating the number and subject of complaints. The quarterly status report also provides up-to-date information on the number and subject of complaints that have been resolved, and the manner in which they have been resolved. This information will be shared with the Bank.

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

i) details and nature of the complaint
ii) the complainant name and their contact details
iii) date
iv) Length of time needed to close the complaint case
v) Corrective actions taken in response to the complaint.

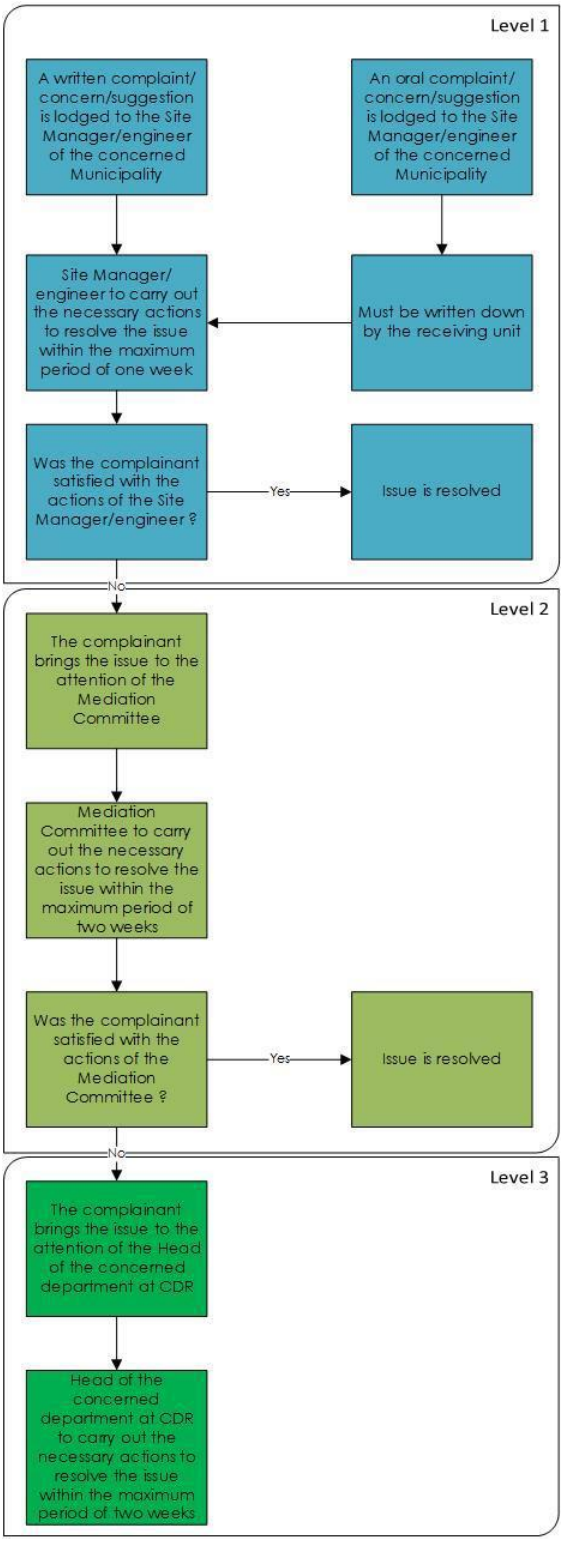
The GRM does not exclude the formal legal process of the national law. If a grievance remains unresolved following application of the project GRM process, the affected person can initiate legal proceedings in accordance with national law and may have recourse to the Appeals Court as warranted.

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 and has a duration of one week. The second level involves reporting to the PMU Director and should be resolved within one weeks. It also follows the Complaints Register form (refer to Annex 4).

Figure 8-1: Grievance Mechanism Process



Source: CDR, 2018

9. CONCLUSION

The Project's main objectives are to enhance the transport connectivity along selected secondary and tertiary road sections in Zgharta caza and to create short-term job opportunities. It is worth to mention that this project was consulted with the public including women and displaced communities to inform the public about the proposed project.

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

On the other hand, job opportunities will be created to the local community during the rehabilitation phase. It is worth to mention that these impacts are short in term and will diminish as soon as the project is completed. As for the operational phase, the assessed socioeconomic impacts were mostly positive in nature in terms of traffic and road safety and livelihood improvement within the project area. However, on the long term the proposed project will contribute in increasing vehicular pollutant levels (CO, NO_x, SO_x, 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 and social impacts that might arise from the rehabilitation of the proposed roads in Zgharta 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 that includes proper monitoring of different activities as well as abiding with all relevant national and international policies, standards and regulations. The project has also developed a GRM that has been put in place for all project stakeholders, including workers and local community.

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ANNEX 1: ENVIRONMNETAL COMPONENTS ALONG THE ROADS

Road	Socio-Economic (Shops, Residential areas, traffic)	Natural Environment (Trees, land use, surface water)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals)
L4-ZG-RD1A-1	S0: pharmacy S0-S200: traffic S0-S500: urban S600: gas station S720: gas station S800: round about S1020: urban S930: road get separated till S1260 S1370: school S1600: park meters, heavy traffic S1770: shops	S200: green areas to the right S1900: square trees	There is light through the road
L4-ZG-RD1A-1 (SARAYA)	S380: hospital S500: end of separated road S700: gas station S850: traffic S1080: pharmacy, maintenance shops S1100: round about S1300: Bank, heavy traffic, main road, parking lots, buildings S2120: hospital S2220: less building, gas station S2750: gas station S3250: gas station	S1810: palms on the separation of the road S2220-S2750: palms on the separation of the road S3250 Eucalyptus trees on the separation, olive trees on the left and right S3800: palm S4140-S4650 cypress trees on the separation, olive trees to the left	S0-S2320: There is light S180: Solid waste bins S450-S1080: light and solar panels S2420-S4650: need more light
L4- ZG-RD1A-2	S0: church to the left S100-S340: urbanized, small shops S600: industrial hangar to the left S840: gas station S860-S1600: some small houses	S410: green trees down the road to the right S600: figs and oranges to the right S640-S810: orange fields S860-S1600: olive trees S1820: square shape trees	S530: Irrigation pond on the left S710: need safety S1240: need safety S1530: Power station There is light through the road

Road	Socio-Economic (Shops, Residential areas, traffic)	Natural Environment (Trees, land use, surface water)	Infrastructure (Lighting, Phone/Electricity lines, culverts, water canals)
	S1730: cemeteries S2180: water tank S2400: villas and castles S2240: church	S1870:S2180: agricultural area, orange trees S2400: olive trees fields S2700: orange trees down the road to the right S2850: river S2930: orange trees S2960-S3720: olive and orange trees S3800: cow farm	
L4- ZG-RD1A-3	S0-S100: Building on the left and right of the road, minimarkets, local road S520: furnisher shop to the left S1510-S1550: urbanized S1650: church S1750: live oil mill to the right S1900: gas station S1950: 2-3 story buildings S2010: narrow	S0: orange and cypress trees on the left S170: green areas to the right S270-S400: olive trees to the left and right S480: orange trees to the right S600-S710: olive trees to the left and orange trees to the right S880-S1080: orange trees to the right S1130: gardens next to houses S1250: orange trees to the right S1310: stream S1420: houses and orange trees to the left S1820: pine trees inside a fenced area, olive	
L4-ZG-RD-1D	S1100: shops and one 2 story building S1400-S1600: small buildings and car parking on the road S1800-S2100: local, narrow road, village houses S3100: villas S3300: not residential S4300-S4380: concrete blocks industry	S0: pine trees on the side of the road S100-S4800: olive trees fields S700: stream S3640: green houses	There is light through the road S900: channels

ANNEX 2: CODES OF CONDUCT

1. Background

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

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

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

2. Definitions

The following definitions apply:

- **Gender-Based Violence (GBV)** – is defined as any conduct, comment, gesture, or contact perpetrated by an individual (the perpetrator) on the work site or in its surroundings, or in any place that results in, or is likely to result in, physical, sexual or psychological harm or suffering to another individual (the survivor) without his/her consent, including threats of such acts, coercion, or arbitrary deprivations of liberty.

- **Child Abuse and Exploitation** (CAE)- is defined as physical, sexual or psychological harm of minor children (i.e. under the age of 18) including using for profit, labor, sexual gratification, or some other personal or financial advantage. This also includes other activities such as using computers, mobile phones, or video and digital cameras appropriately, and never to exploit or harass children or to access child pornography through any mediums

- **Child Protection (CP)** - An activity or initiative designed to protect children from any form of harm, particularly arising from CAE.

- **Child-** is used interchangeably with the term 'minor' and, in accordance with the United Nations
  United Nations Glossary on Sexual Exploitation and Abuse, refers to a person under the age of 18

- **Grooming** – is defined as behaviors that make it easier for a perpetrator to procure a child for sexual activity. For example, an offender might build a relationship of trust with the child, and then seek to sexualize that relationship (for example by encouraging romantic feelings or exposing the child to sexual concepts through pornography).

- **Online Grooming-** is the act of sending an electronic message with indecent content to a recipient who the sender believes to be a minor, with the intention of procuring the recipient to engage in or submit to sexual activity with another person, including but not necessarily the sender. For further details, refer to the *Criminal Code Act 1995,* Division 474 (telecommunications offences, subdivision C).

- **Survivor/Survivors-** is defined as the person(s) adversely affected by GBV or CAE. Women, men and children can be survivors of GBV; children of CAE.

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

- **Work site-** is defined its the area in which Roads Rehabilitation works are being conducted, as · part of interventions planned under the World-Bank-funded Roads and Employment Project (REP).

- **Work site surroundings-** are defined as the' Project Area of Influence' which are any area, urban or rural, directly affected by the project, or located within the distance of three kilometres radius from the work site and/or worker's camps, including all human settlements found on it.

- **Consent** – is defined as the informed choice underlying an individual's free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. Any use of a threat to withhold a benefit, or of a promise to provide a benefit, or actual provision of that benefit (monetary and non-monetary), aimed at obtaining an individual's agreement to do something, constitutes an abuse of power; any agreement obtained in presence of an abuse of power shall be considered non-consensual. In accordance with the United Nations, the World Bank considers that consent cannot be given by children under the age of 18, even in the event that national legislation of the country into which the code of conduct is introduced has a lower age Mistaken belief regarding the age of the child and consent from the child is not a defence.

- **Contractor** – is defined as any 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 Zgharta Caza

Location: Zgharta Municipality
Date & Time: 12/10/2019 from 10:00 to 12:00
Attendees: Attendance sheet is attached

Proceedings:

1. Welcome Remarks

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

2. Presentation

The Environmental Expert from ACE provided a detailed description of the roads and proposed rehabilitation works, the 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

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

- A member of the municipal council of Zgharta who is also a road engineer noted some safety issues that need to be addressed regarding some of the selected roads. For example, on the Majdlaya road, during harvest season, there is a section of the road where the trucks pick up the harvest to take them to the vegetable market, carrying red soil from the fields onto the road. This needs to be minimized by installing a base course layer on the road. He also noted that in an area on the same road, there is a turn near a stone factory where wastewater overflows, leading to a slippery surface and causing traffic hazards and accidents.
- He also proposed for some elevated pedestrian crossings with stop signs regarding the main road coming from Majdlaya towards Zgharta. These crossings will also be used as humps to slow the traffic.
  The member's contact information was obtained by the Consultant in order to communicate further and integrate all his comments and technical input into the design of the project.
- It was requested to install physical obstacles to force deceleration (rumble strips) since signs alone are not sufficient to slow the drivers down near residential areas.

- It was also noted that on the Aardat road, there is a lot of pedestrian traffic due to commercial activity in the area but there are no sidewalks. It was therefore proposed to install sidewalks in that area as well as to protect them such as by adding sidewalks on the crossings.
- Water streams that cross the actual road need to have a kind of basin at its end in order to collect the sediments brought by the water to avoid spreading of sediment on the asphalt. Such basin should be cleaned and emptied regularly.
- It was also proposed that the rehabilitation work stretches to the extent of Kfaryachite intersection on the road 1D (only about 400m to be added).
- Questions were raised on the timing and budget for the Zgharta district roads, which were responded to by the consultant and CDR.
- 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 women who were attending the public hearing. The purpose of the session was to obtain women's feedback on the project and focus on their concerns and suggestions. The main issues raised during this session are as follows:

- The Director of Horsh Ehden nature reserve supported the idea of helping women employment in the project and said that from their experience, they have had a lot of success recruiting women to do maintenance works for their trails, and as guides, hostesses and in supplying food to the workers. In fact, there are women cooperatives that provide catering services. She also mentioned that there is an abundance of highly qualified female engineers in the area who can work on the project.
- None of the women participants expressed any concerns about the restriction of movement during the rehabilitation works due to the influx of workers to the area.
- Most of the women participants expressed their satisfaction with this project as they see it as an opportunity to create jobs specifically for the locals.
- Most of the women agreed that for Zgharta, it would be highly desirable for both the residents and the contractor to conduct all rehabilitation works during the summer, as most of the residents will be in Ehden due to its cooler weather. It also means that there will be no schools during this period, minimizing exposure of students commuting on roads to ongoing construction works.
- One of the women, who had a recent experience with damaged infrastructure works on a road near her house, stressed on the need to have a clear coordination mechanism with other authorities to quickly address potential problems (like emergency unit), such as burst water or wastewater pipe.
- It was suggested to have wheelchair access on the pavements since this is currently not available.

- Regarding labor work, the women felt that their main role would be in encouraging their male family members to participate in such work, trying to eliminate the culture of shame surrounding this type of job.
- Women participants felt that during operation, the project will contribute positively to improving women's participation in the economy by making transportation safer and more convenient.

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


مقدمة

List of Attendees

PUBLIC HEARING - ATTENDANCE SHEET جلسة مشاركة عامة - الحضور
مشروع الطرق والعمالة في لبنان
4.1 - Zgharta

Date: 12-Oct-19

الاسم Name	المؤسسة Institution	البلدة Town	الصفة Position	الهاتف Telephone	الامضاء Signature
ميرا تادرس	بلدية	زغرتا	مسؤولة النشاطات والسياحة	70717046	
غسان طيبون	بلدية	زغرتا		76 111520	
انطونيوس اكزافيه	مختار	اهدن	مختار	٠٣/٩١٠ ٢١٨	
سيلفون عطوفي	CDR		مرشدي	03-284499	
سامرا سا	مصلحة اهدن	اهدن	مرشدة/مديرة المصلحة	70. 601601	
داود بارز	بلدية زغرتا	زغرتا	رئيس بلدية	03/113070	

PUBLIC HEARING - ATTENDANCE SHEET جلسة مشاركة عامة - الحضور
مشروع الطرق والعمالة في لبنان
4.1 - Zgharta

Date: 12-Oct-19

الاسم Name	المؤسسة Institution	البلدة Town	الصفة Position	الهاتف Telephone	الامضاء Signature
مرتا حداد غريغوار	مديرية ثانوية زغرتا الرسمية	زغرتا	مديرة	03 700665	
شربل كيوان	ثانوية زغرتا الرسمية	,,	ممثل ناظر التعليم	71/500112	
انطونيو غرغيش	قنصلية	زغرتا	رئيس بلدية	03/778555	
ايوب نوفل	ثانوية زغرتا الرسمية	زغرتا	رئيسة	03/340249	
سارة اكلا	ACE		مهندسة بيئية	71/39 1133	
بيار الاعور	ACE		مدير مشروع	03.871074	
جوانا زغيب	,,		فنية بيئي	01/433250	
لارا عون	,,		,, ,,	79/196895	

Presentation during Public Hearing

4. وصف المشروع

4.1 الطرق التي سيتم إعادة تأهيلها في قضاء زغرتا

- مجدليا - عردات – زغرتا
- زغرتا - كفردلاقوس حتى تقاطع دير دبوح/عشاش
- زغرتا - أصنون - قره بلش
- بشدين - كفرشخنا - كفر زيدا

مجموع طول الطرق المذكورة أعلاه: 19.2 كيلومتر

3. مراحل إعداد الخطة البيئية والإجتماعية

دراسة إطار السياسات والأطر القانونية

دراسة البيئة الطبيعية والإجتماعية في موقع المشروع

تقدير وتقييم الآثار البيئية المحتملة الناتجة عن المشروع

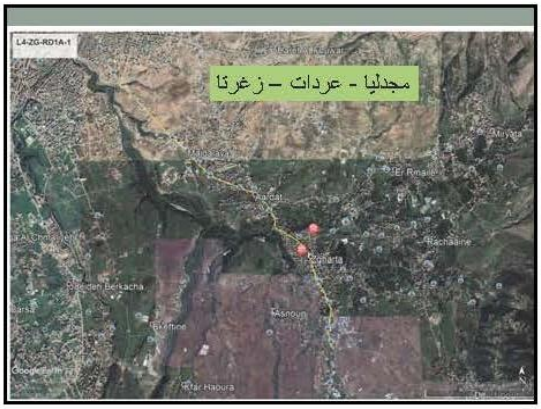
المشاورة العامة مع المعنيين والمهتمين بالمشروع

تحديد الإجراءات التخفيفية للآثار السلبية

تحديد وسائل الرصد والمراقبة

4.2 موقع المشروع في قضاء زغرتا

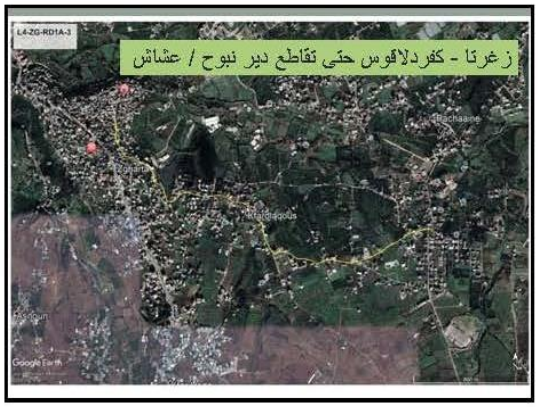
4.3 الطرق المقترح تأهيلها في قضاء زغرتا



4.3 الطرق المقترح تأهيلها في قضاء زغرتا


L4-ZG-RD1A-2
زغرتا - أصنون - قره باش


4.3 الطرق المقترح تأهيلها في قضاء زغرتا


L4-ZG-RD1A-3
زغرتا - كفردلاقوس حتى تقاطع دير نبوح / عشاش


4.3 الطرق المقترح تأهيلها في قضاء زغرتا


L4-ZG-RD-1D
بشنين - كفرشخنا - كفر زينا


4.4 صور لعدة مواقع ضمن المشروع في قضاء زغرتا

4.4 صور لعدة مواقع ضمن المشروع في قضاء زغرتا

4.4 صور لعدة مواقع ضمن المشروع في قضاء زغرتا

4.4 صور لعدة مواقع ضمن المشروع في قضاء زغرتا

4.4 صور لعدة مواقع ضمن المشروع في قضاء زغرتا

5. ماذا يتضمن المشروع خلال مرحلة التنفيذ؟

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

- تأمين/تأهيل الطبقات الإسفلتية والاسس
- 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 أواصلاح مجاري مياه الأمطار
أضرار على التربة النحتية
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 القضاء
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


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 ملوّثات الهواء والضجيج والاهتزازات
زيادة الانسكابات والتسريبات الناتجة عن المركبات المتنقلة
تلوّث التربة والمياه
التدابير التخفيفية
الصيانة الدوريّة للطرق
صيانة البنية التحتيّة مع تفادي تأثيرها على الطرق
تقليل حركة مرور الشاحنات الثقيلة بهدف المحافظة على الطريق


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 المهلة
التأكد من أن الانذارات التحذيرية وأنظمة الإضاءة ظاهرة وموجودة في الأماكن المكتظة وخاصة قرب المدارس والمستشفيات والمناطق التجارية
حصر أعمال التنفيذ خلال فترة النهار


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

ANNEX 4: GRIEVANCE REDRESS MECHANISM (GRM) FORM

Reference No:	
Contact Information **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