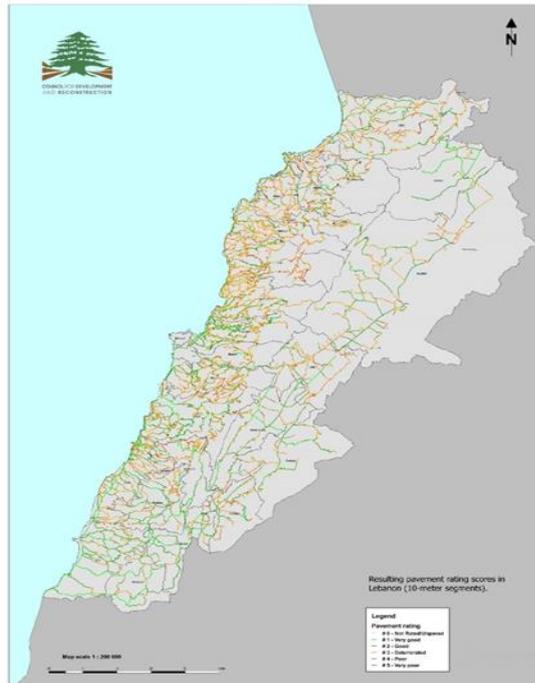




**LEBANESE REPUBLIC
COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION
(CDR)**

**ROADS & EMPLOYMENT PROJECT
LOAN NO. 8705-LB**



ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

FOR

**ROADS ROUTINE MAINTENANCE OF REMAINING ROADS
FOR LOT5 (KOURA CAZA)**

August 2022

EXECUTIVE SUMMARY

INTRODUCTION

The Government of Lebanon (GOL) has solicited and obtained World Bank (WB) financing for the Roads and Employment Project (REP). The Council for Development and Reconstruction (CDR) is acting as the executing agency on behalf of the GOL and its Council of Ministers (COM). The REP involves maintenance activities that are confined within the alignments of existing roads with no road widening, no involuntary resettlement, and no land acquisition. As such, the WB classified the REP as a category B project that require the preparation of an Environmental and Social Management Plan (ESMP) for its sub-components. Noting that the Project was signed before October 2018, date of effectiveness of the Environmental and Social Framework (ESF). Accordingly, a series of ESMPs were stipulated to be prepared for these roads and put together by CDR in packages for bidding purposes. In this context, CDR awarded the contract number 20379 to TEAM International, hereinafter referred to as the Consultant, to prepare the assessment, design and ESMPs for roads in the districts of Bcharre, Batroun, Koura, and Bcharre. This ESMP is concerned with roads within the Koura district.

PROJECT DESCRIPTION

The REP consists of the maintenance activities to be performed during the project vary between one road and the other, depending on the road rating in terms of the condition of the pavement, shoulders, potential flooding and drainage, potential landslide/soil erosion and retaining walls, pedestrian walkways, and addition or maintenance of street lighting. Routine Maintenance activities will be executed for a period of two years, for each Caza in Lot 5- Tripoli, Koura, Batroun and Bcharre Cazas, for Primary roads (including International roads/ Highways) as priority and for Secondary roads where funds are available. This report will further study the Koura caza.

The land acquisition did not occur during the design of any road under study. In the Koura district, one primary road is proposed, whose details are elaborated within the ESMP. However, in case the suggested maintenance work is not applicable, the secondary roads will be considered.

During the execution of maintenance activities, roads will not be closed or shutdown. Before the execution of maintenance works, the Contractor will secure the access and traffic movement via other alternative routes and means in coordination with the related Municipality. The duration of the project is 18 months with a one -year liability period. It is assumed that an estimate total number of workers shall range between 10 and 20. These workers must be hired preferably from the surrounding local communities (including Syrian labors that reside in the concerned project areas).

BASELINE ASSESSMENT

The environmental and social assessment recorded the existing conditions within the project area including physical, biological, and socioeconomic conditions prior the project implementation and operation. Baseline data and field surveys were conducted to describe the status of the following environmental receptors: air quality, water quality, soil quality, geological conditions, climate and meteorology, natural habitats and biodiversity, land-

use/land-cover, acoustic environment, cultural resources, and socio-economic conditions (employment opportunities, labor influx, social tensions, labor induced Sexual Exploitation and Abuse (SEA) Sexual Harassment (SH), occupational health and safety).

The topography shows that the primary road in Koura Caza starts at Kfar Hazir at an elevation of 42m above seas level, passes through Amioun, Kfaraaka, Kousba, and Rechdibbine until it reaches an elevation of 636m ASL at Moghr El Ahwal after 11km where it ends.

The geology of the studied roads was investigated for outcropping formations, subsurface stratigraphy, structure (faults, folds, seismic, etc.), hydrogeology (groundwater and sea water intrusions) and hydrology (surface water). Assessments showed that the main geological units outcropping in the Koura area are the chalky to marly limestones of the Chekka Formation (C6), and the limestones and marly limestones of the Maameltain Formation (C5). Also, a Miocene sequence of both massive limestone (m2) and alterations of marl, sandy limestone and conglomerates (mL1), outcrops were recorded in Amioune, Kfar Hazir, Bechmizzine, and Btourram. The mean estimated transmissivity for the Miocene in the Koura-Zgharta aquifer has been reported to be $6.4 \times 10^{-4} \text{ m}^2/\text{s}$ (geometric average), with a range between 5.8×10^{-5} and $6.4 \times 10^{-2} \text{ m}^2/\text{s}$ (Khayat, 2001). The study area is characterized by the presence of some springs and many groundwater wells, with no major permanent rivers crossing the selected roads for maintenance.

The climate and meteorological parameters play an important role in the transport and dispersion of pollutants in the atmosphere. While precipitation is negligible in the summer season between the months of June and September, the highest precipitation is recorded for the month of January. The total precipitation in Koura, like the rest of Lebanon, shows large variability across years and locations. The wettest month precipitation is the month of January with an average rainfall of 190 mm (Figure 4-1 in Annex B). The total number of rainy days amounts to around 82 per year. No snow is recorded in the Koura caza. As for temperature, the lowest is recorded in January (average at 10°C) and the highest in August (average at 30°C) (Figure 4-2 in Annex B).

Data regarding air pollution levels in the area was also obtained. The study showed that the major air pollutants induced by traffic include Carbon monoxide (CO), Nitrogen Oxides (NO_x), Sulfur oxides (SO_x), Hydrocarbons (HC), and Particulate matter (PM). These pollutants are associated with potential adverse health impacts with long-term exposure to atmospheric concentrations exceeding threshold limits. Data were obtained from data gathered from the MOE/ UNDP project, 'Air quality assessment in an East Mediterranean country: the case of Lebanon, 2014' which monitored criteria air pollutants. The study showed that the concentrations collected by the MoE stations for all criteria air pollutants in 2018 for the studied area are within the national ambient air quality standards defined by MOE Decision 16/1 dated 2022.

Regarding natural habitats and biodiversity, given the nature of the project, the direct influence area concerns existing roads. Consequently, a rapid biological assessment has been carried out to draw the ecological profile of the adjacent areas to the concerned roads. The field investigation did not aim for an exhaustive inventory of the biodiversity of the project area but a general overview of present species (mainly flora) and habitats.

The assessment showed that Koura roads involve a path that is already under anthropogenic influences. The natural environment in the study area is degraded by both agricultural activity

and urbanization and does not harbor any pristine habitat of particular conservation importance. Specifically, the main roads are predominantly surrounded by olive trees. Scrubland with some dispersed bigger trees cover around random areas in Koura district. The vegetative cover becomes intermittent at the village centers away from the primary road (secondary roads and branches) where a medium density urban fabric prevails.

Finally, a socio-economic assessment was conducted in the project area to map the demographic, social, and economic baseline conditions at the level of Koura Caza. The assessment allowed drawing conclusions regarding the project's potential impacts on the socio-economic conditions of the study area. As for the total number of officially registered Syrian refugees in the Koura Caza was reported by UNHCR (2021) to be 13,534. No Palestinian camps are present in the Caza.

POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

The maintenance phase of any development is known to have potential adverse impacts on several indicators including traffic, air quality, noise level, construction waste, water and soil quality, landscape and visual intrusion, resources consumption, damage to existing utilities, health and safety, as well as socio-economics. During the maintenance phase, these impacts are temporary with the majority being minor or moderately negative (table I). During operation, the maintenance of the road, combined with the natural increase in the vehicle fleet size, will ultimately increase traffic volume and hence, typical impacts associated with increased traffic will be inevitable in the long term. Yet, improved traffic flow on maintained roads will lead to improved fuel efficiency and better engine performance, thereby reducing vehicle emissions and maintenance. Maintained roads can lead to improved landscape and visual intrusion, albeit some increase in light glare. Finally, improved safety design of roads can reduce the potential for accidents. The magnitude and significance of these impacts is similar along both roads.

Table I Summary of potential impacts of selected roads for maintenance in Koura district

<i>Potential Impact</i>	<i>Maintenance phase</i>		<i>Operation phase</i>	
<i>Traffic</i>	Moderate negative		Minor negative to	Positive
<i>Air quality</i>	Minor negative		Minor negative to	Positive
<i>Noise</i>	Moderate negative		Minor negative to	Positive
<i>Biodiversity</i>	Minor negative		Minor negative	
<i>Construction Waste</i>	Minor negative		Neutral	
<i>Soil and water</i>	Moderate negative		Minor negative to Zero	
<i>Resources consumption</i>	Moderate negative		Neutral	
<i>Existing infrastructure</i>	Minor negative		Neutral to Positive	
<i>Visual Intrusion</i>	Minor negative		Minor negative to	Positive
<i>Health and Safety</i>	Moderate negative		Minor negative to	Positive
<i>Socio-Economic</i>	Moderate negative	to Positive	Positive	
<i>Archaeology / Cultural Heritage</i>	Neutral		Neutral	
<i>Expropriation/involuntary resettlement</i>	Neutral		Neutral	

As for socio-economic impacts, during the maintenance phase, they are expected to be positive in terms of providing job opportunities and moderately negative in terms of temporary increase in travel time, impeded accessibility to residences / businesses, and potential health and safety, and social tensions that could lead to exploitation, abuse and harassment. During the operation phase, the maintenance of roads is expected to have positive impacts by improving access to remote areas, reduced trip times, reduced traffic congestion and accidents, and enhanced livelihood opportunities.

ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

Mitigation Plans

While the road maintenance is associated with some potential negative impacts, most of them can be alleviated. Environmental and Social mitigation measures should be adopted to eliminate or minimize these impacts.

Monitoring Plan

Since the project is a category B, monitoring activities for such projects rely primarily on visual observation and documentation with photos although measurements of certain indicators (traffic count, air / water quality and noise level) can be conducted upon public complaints. The project supervising consultant holds the responsibility of monitoring activities during the maintenance phase to ensure the implementation of the mitigation plan by the contractor. Upon public complaints, a third party (consultant) can also be appointed by CDR to conduct periodic monitoring with measurements of environmental indicators depending on the nature of the complaint. Monitoring indicators / activities during the maintenance phase is defined in this report as a guidance for the contractor to submit his Construction Environmental and Social Management Plan – CESMP before work commencement.

During the operation phase, regular monitoring activities become more part of the duties and responsibilities of local municipalities and stakeholders. Similar to the maintenance phase, upon public complaints, a third-party consultant can also be appointed by CDR (up to 2 years after project completion) to conduct periodic monitoring with measurements of environmental indicators depending on the nature of the complaint.

During the maintenance phase, the Supervising Consultant shall submit a quarterly report about the monitoring activities to various stakeholders including the CDR and the municipalities. These reports shall be made readily available or accessible to the public upon submittal. The content of a typical report should mirror the indicators of the mitigation plan with proper documentation with photos and actions taken in the event of accidents, concerns or complaints.

CONSULTATION, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

Public Consultation

The public consultation is to inform the local authorities about the project and get their opinion on the project implementation. Due to the project's extent over the entire Caza, the union of municipalities is the party that will represent all concerned municipalities. As well, local concerned NGOs are to be informed with the project and a virtual meeting is to be planned to get their feedback. The meeting was conducted at the Federation of Municipalities in the Koura Caza in Amioun. The number of attendees was 17 with 3 females which included 11 heads of municipalities in the Koura Caza, 5 members of municipal boards of villages in the Caza, the Secretary of Union Municipalities of Koura, and 1 contractor. The complete attendance list is presented in Annex E.

The most important issues that were raised by the attendees is enforcing a timely construction schedule, giving priority employment to local people, and using good quality construction material. However, employment is also granted to Syrian workers in such a way that the skilled jobs will be given to the Lebanese workforce and the unskilled jobs are primarily filled by Syrian workers.

Grievance Redress Mechanism (GRM)

A grievance redress mechanism (GRM) is in place to allow stakeholders to voice their concerns during the project phases: pre-construction, construction, and operation. The GRM is designed to allow a timely resolution of concerns, assuring stakeholders that grievances have been heard and that the institutionalized mechanism will yield a fair and impartial outcome. Furthermore, the grievance mechanism is applicable for 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.

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
TABLE OF CONTENTS	3
LIST OF TABLES	6
LIST OF FIGURES	6
LIST OF ABBREVIATIONS	7
LIST OF NOMENCLATURES.....	8
1 INTRODUCTION	1
1.1. Project background.....	1
1.2. Project Rationale	1
1.3. Report Objectives	1
1.4. Methodology.....	2
2 LEGAL, INSTITUTIONAL, STANDARDS AND POLICIES FRAMEWORKS.....	3
2.1 Legal Framework.....	3
2.2 Institutional.....	3
2.3 World Bank Policies.....	6
2.3.1. <i>Safeguard Policies</i>	6
2.3.2. <i>Access to Information (AI) policy</i>	6
2.3.3. <i>EHS guidelines</i>	6
2.3.4. <i>Consultation and Disclosure Policy</i>	6
3 PROJECT DESCRIPTION	7
3.1 Location.....	7
3.2 Project activities	9
4 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS.....	10
4.1 Physical environment	10
4.1.1 <i>Topography</i>	10
4.1.2 <i>Geology</i>	10
4.1.2.1 Lithology and main geological formations	10
4.1.2.2 Faults, erosion, landslides, and earthquakes	11
4.1.3 <i>Hydrology</i>	11
4.1.4 <i>Climate and meteorology</i>	12
4.1.5 <i>Ambient air quality and noise levels</i>	12
4.1.6 <i>Land use land cover</i>	13
4.2 Biological Environment.....	13
4.2.1 <i>Flora</i>	14
4.2.2 <i>Fauna</i>	14
4.2.3 <i>Ecologically Sensitive Areas</i>	14
4.3 Socioeconomic Environment.....	14

4.3.1	<i>Demographic Profile</i>	14
4.3.2	<i>Social Activities</i>	15
4.3.3	<i>Economic Activities</i>	15
4.3.4	<i>Educational Services</i>	17
4.3.5	<i>Healthcare Services</i>	17
4.3.6	<i>Traffic Survey</i>	17
4.3.7	<i>Road Sensitive Receptors</i>	17
5	POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS	18
5.1	Potential positive impacts during maintenance	18
5.2	Potential Environmental impacts during the maintenance phase	19
5.3	Potential negative impacts during the operation phase.....	20
5.4	Summary of impact analysis.....	20
6	MITIGATION OF ENVIRONMENTAL AND SOCIAL IMPACTS	22
6.1	Environmental Mitigation Measures during maintenance.....	22
7	ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN	26
7.1.1	<i>Training</i>	29
7.1.2	<i>Reporting</i>	29
7.1.3	<i>Documentation and Reporting</i>	29
7.1.4	<i>Guidelines for Health and Safety Plan during maintenance</i>	30
8	CONSULTATION, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM	31
8.1	Public Consultation	31
8.2	Grievance Redress Mechanism	32
8.2.1	<i>GRM for Communities</i>	32
8.2.2	<i>GRM for Workers</i>	33
9	REFERENCES	36
	ANNEX A: PROJECT DESCRIPTION	38
1.	Material and Equipment	39
2.	Site Staffing	39
3.	Site Facilities	39
4.	Equipment used and their technical environmental specifications	40
	ANNEX B: BASELINE ENVIRONMENTAL AND SOCIAL DATA	42
1.	Roads Photos	42
2.	Roads Maps	43
3.	Geology Description.....	49
4.	Hydro-geology Description	49
5.	Climate and meteorology.....	50
6.	Ambient air	51
7.	Land use / Land cover	54
8.	Socioeconomic Environment.....	55

ANNEX C: ESMP CHECKLISTS.....57
ANNEX D: CODE OF CONDUCT.....62
ANNEX E: PUBLIC PARTICIPATION.....63
ANNEX F: COMPLAINTS REGISTER FORM.....77

LIST OF TABLES

Table	Page
Table 2-1 Summary of functional responsibilities of transport/traffic involved ministries/agencies	3
Table 2-2 List of selected legislation relevant to the Project	4
Table 3-1 Location and characteristics of Koura district selected roads for maintenance	7
Table 5-1 Environmental and Social Impacts for the Koura district roads during the maintenance phase	18
Table 5-2 Environmental and Social Impacts for the Koura district roads during the operation phase	20
Table 5-3 Summary of potential impacts of selected roads for maintenance in Koura district	21
Table 6-1 Environmental and Social Mitigation Measures for the Koura district roads during the maintenance phase	22
Table 7-1 Environmental and Social Monitoring Plan for the Koura district roads during the maintenance phase	26

LIST OF FIGURES

Figure	Page
Figure 3-1 .Location overview and elevation of selected roads for maintenance within the Koura district	8
Figure 4-1 Syrian refugees distribution map in Koura Caza (UNHCR-2021)	16
Figure 8-1 Public participation session with Koura Caza stakeholders	31
Figure 8-2 Typical grievance redresses mechanism for the REP	35

LIST OF ABBREVIATIONS

AREC	American University of Beirut Advancing Research Enabling Communities Center
AUB	American University of Beirut
CDR	Council for Development and Reconstruction
CoC	Code of Conduct
DoA	Department of Antiquities
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ESC	Environmental and Social Consideration
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FI	Financial Intermediary
GIS	Geographic Information Systems
GOL	Government of Lebanon
GRM	Grievance Redress Mechanism
IBA	Important Bird Area
IEE	Initial Environmental Examination
LARI	Lebanese Agricultural Research Institute
MoA	Ministry of Agriculture
MoC	Ministry of Culture
MoE	Ministry of Environment
MoEW	Ministry of Energy and Water
MoIM	Ministry of Interior and Municipalities
MoL	Ministry of Labor
MoPWT	Ministry of Public Works and Transport
MSL	Mean Sea Level
OP	Operational Policy
PIU	Project Implementation Unit
REP	Lebanon Roads and Employment Project
SEA/H	Sexual Abuse and Exploitation and Harassment
WB	World Bank

LIST OF NOMENCLATURES

%	Percent
µg	Microgram
g	Gram
kg	Kilograms
km	Kilometers
Leq	Average equivalent noise levels
Lmin	Minimum noise level
Lmax	Maximum noise level
MJ	Mega Joules
min	Minutes
mm	millimeter
hr	Hour
ha	Hectare
m ²	Square meter
m ³	Cubic meter
ppm	Parts per million
s	Seconds

1 INTRODUCTION

1.1. Project background

The Government of Lebanon (GOL) has solicited and obtained World Bank (WB) financing for the Roads and Employment Project (REP). The Council for Development and Reconstruction (CDR) is acting as the executing agency on behalf of the GOL and its Council of Ministers (COM). The REP seeks to improve transport connectivity along select paved road sections, create short-term employment opportunities for local communities, and support farmers engaged in crop and livestock production.

Therefore, under Lebanese regulations, the REP does not fall under either Annex I (projects requiring a full EIA) or Annex II (projects requiring an Initial Environmental Examination (IEE) of the EIA Decree No. 8633/2012 on the Fundamentals of Environmental Impact Assessment (EIA) in Lebanon. However, the REP triggered the World Bank Operational Policy OP 4.01 requiring Environmental and Social assessment. As such the prepared Environmental and Social Safeguard report will be conducted for the roads within the Koura district (Caza) of the North Lebanon governorate (Mohafazah).

This report represents the Environmental and Social Management Plan (ESMP) for Roads Routine Maintenance activities in Koura Caza (Lot 5) in line with WB safeguard Operational Policies, guidelines and national legislation. Noting that the Project was signed before October 2018, date of effectiveness of the Environmental and Social Framework (ESF). It is worth mentioning that some roads under the REP are already under rehabilitation and that the roads under this ESMP are new roads (primary roads (including International roads/ Highways) as priority and for Secondary roads where funds are available) eligible for maintenance.

1.2. Project Rationale

The ESMF (CDR, 2018) provided the main rationale behind the REP by elaborating about Lebanon's largely adequate extent and coverage of the road network, but with a substantial percentage in poor condition, hindering local and economic development particularly in rural and lagging underserved regions where the condition of the main network is worse than the national average. The ESMP attributed these poor conditions to several factors including years of underinvestment, inefficient spending, weak capacity in road agencies and the absence of asset management tools. The ESMP stressed that this situation was aggravated by the influx of Syrian refugees which has substantially increased traffic demand and the utilization of the road network. Hence, the general objectives of the REP are to improve transport connectivity along selected paved road sections and create short term jobs for Lebanese and Syrians through specific components that encompass maintenance and maintenance, improvement of emergency response capacity, and capacity building and implementation support.

1.3. Report Objectives

The main objectives of the report are the design of the activities that include the maintenance/repair of the following items:

- Roadway pavement repair and milling/overlay of localized pavement depressions
- Damaged reinforced concrete retaining walls/Footwalls/ Masonry Walls repair
- Sidewalk and safety barrier repair

- Storm water drainage network repair
- Lighting Networks and all related electrical and civil works repair
- Road marking & signing implementation
- Other ancillary associated works including traffic management during maintenance.

The Maintenance Standards should generally be based on American Association of State Highway and Transportation Officials AASHTO Maintenance Manual for Roadways & Bridges, 4th Edition 2007, guided modified only where needed to suit local conditions.

1.4. Methodology

In order to achieve the ESMP objectives outlined above, we have reviewed relevant project designs and studies particularly the ESMF prepared for the project. In addition, we will:

- Examine the national legislation and World Bank safeguard policies relevant to the project
- Conduct field visits to observe and document baseline conditions and collected data from the relevant municipality
- Synthesize and process information related to coverage using the geographic information systems (ArcGIS Desktop Version 10.61 by ESRI, License type: Advanced) to prepare baseline maps
- Assess environmental and social impacts associated with the project at various stages of the project using factors such as health and safety as well as the natural environment
- Define mitigation measures, wherever relevant, to alleviate or reduce potential adverse impacts
- Develop a monitoring plan with emphasis on the maintenance phase when impacts are expected with estimated implementation resources
- Document public consultation and opinions with potentially affected stakeholders
- Use the grievance redress mechanisms (GRM) that was developed and is operational.

Note that since the project is category B under the World Bank guidelines, no field measurements of environmental indicators were anticipated (i.e., traffic, air quality, noise levels, water quality) under this contract. Instead, we relied on data from existing studies wherever available. We equally used a worst-case condition approach that would form an envelope of the maximum possible impact which, when judged to be minor or moderate, reflects an acceptable project impact. Details of such an approach are outlined when assessing a specific indicator below (i.e., air quality and noise).

2 LEGAL, INSTITUTIONAL, STANDARDS AND POLICIES FRAMEWORKS

2.1 Legal Framework

Several laws, decrees, and decisions in Lebanon define the environmental standards and regulations to be met while implementing projects. The most basic and general law is Law No. 444 (Environment Protection Law) dated 8 August 2002. Table 2-2 presents a list of selected .legislation relevant to the Project

2.2 Institutional

A statement of the transport/traffic related mission of each including aspects related to road-highway construction is summarized in Table 2-1 below. At this stage, it is expected that the proposed project will involve primarily the CDR. Since some selected roads for maintenance may pass near sensitive areas, close coordination with relevant ministries is also anticipated in the event any finds are made. At the completion of the project, the road becomes under the jurisdiction of the MoPWT for the purpose of maintenance and maintenance whenever required.

Table 2-1 Summary of functional responsibilities of transport/traffic involved ministries/agencies

<i>Agency</i>	<i>Role in project</i>
<i>Council for Development & Reconstruction (CDR)</i>	<input type="checkbox"/> Monitors activities of construction contractors to ensure delivery as per contracts, which will include mitigation and monitoring measures identified in the ESMP
<i>Ministry of Public Works and Transportation (MoPWT)</i>	<input type="checkbox"/> Responsible for operating and maintaining these roads following project completion.
<i>Ministry of Interior and Municipalities (MoIM)</i>	<input type="checkbox"/> Municipalities involved in the project have a role in collaborating with the contractor to implement environmental management related measures including solid waste management, wastewater management, traffic management, etc.
<i>Ministry of the Environment (MoE)</i>	<input type="checkbox"/> Compliance of ESMP with the Lebanese environmental standards and regulations issued by MoE
<i>Ministry of Culture (MoC) –Department of Antiquities</i>	<input type="checkbox"/> In case of archaeological chance finds, review and approve project specific “Archaeological Chance Find” procedures which would be used by construction contractors, consulting engineer and archaeological consultants to address actions to be taken if unrecorded archaeological materials are encountered during the course of project implementation
<i>Ministry of Energy and Water (MOEW)</i>	<input type="checkbox"/> Coordinate with relevant authorities under the MOEW in case of accidental damage to water and electricity related infrastructure during project implementation.
<i>Ministry of Agriculture (MoA)</i>	<input type="checkbox"/> Coordinate with MOA in case of the need for tree cutting
<i>Ministry of Labor (MoL)</i>	<input type="checkbox"/> Ensure labor laws are adhered to <input type="checkbox"/> Issue work permits for foreign labor

Table 2-2 List of selected legislation relevant to the Project

<i>Legislation</i>	<i>Date of Issue</i>	<i>Subject</i>	<i>Relevance to the project</i>
<i>Environment-related legislation</i>			
<i>Law 80</i>	10/10/2018	Integrated solid waste management law	The requirements of the law shall be adhered to for the management of solid wastes generated from the project.
<i>Law 78</i>	13/04/2018	Law for the protection of air quality	The requirements of the law shall be adhered to for the management of air emissions from the project.
<i>Law 77</i>	13/04/2018	Water Resources Law	Penalizes unauthorized discharges or disposal of any kind of waste in water resources
<i>MOE Decree 8803/2002 and its amendments</i>	04/10/2002	Organizes the activity of quarries and crushers, licensing procedures, as well as the operation, management and maintenance of quarries	Ensures the provision of construction material and the disposal of construction waste comply with the decree
<i>Law 444</i>	29/7/2002	Environmental protection framework law, includes the general provisions for the protection of the environment	Ensures project activities are in line with the requirements of the Law, particularly the articles in Chapter 5 on the protection of environmental media (air, coast, water, noise, facilities, natural resources, etc.)
<i>MOE Decision 8/1</i>	30/1/2001	Updates Decision 1/52 and in setting of the National Standards for Environmental Quality by the MOE	Ensures project activities comply with national environmental standards
<i>MOE Decision 1/52</i>	12/9/1996	Setting of the National Standards for Environmental Quality by the MOE	Ensures project activities comply with national environmental standards
<i>Law 558</i>	24/07/1996	Law for the protection of forests	The requirements of the law shall be adhered to for the protection of forests.
<i>Decree 2761</i>	19/12/1933	Guidelines related to wastewater management and disposal	Ensures waste management activity comply with the decree
<i>Decree Law 8735</i>	23/08/1974	Maintaining general cleanliness	Ensures project activities adhere to this decree particularly in terms of waste disposal
<i>Decision 16/1</i>	2022	Sets the National Standards for Environmental Air Quality	Ensures that project activities abide by the National Standards
<i>Cultural heritage related legislation</i>			
<i>Decree law 166</i>	7/11/1933	Antiquity law	Defines chance find procedures that should be followed in case antiquities were identified in the project site
<i>Urban/ rural planning and construction-related legislation</i>			
<i>Law 58</i>	29/05/1991	Expropriation Law	Adhere to provisions in case the project requires expropriation.
<i>Law 118</i>	30/06/1977	Municipalities Law. It stipulates the role of the Municipalities and Municipalities councils.	Defines the roles of municipalities in the provision of environmental services such as solid waste management, wastewater management, etc.

<i>Legislation</i>	<i>Date of Issue</i>	<i>Subject</i>	<i>Relevance to the project</i>
<i>Labor-related legislation</i>			
<i>Decision 29/1</i>	2018	Businesses, professions, trades, and jobs that should be restricted to Lebanese only	Restricts significant number of jobs to Lebanese only and allows Syrians to occupy jobs that are not restricted to Lebanese especially in the construction sector
<i>Decree 3791</i>	30/06/2016	Sets minimum wage for employees and workers	Adhere to the requirements of this decree with regards to wages of employees on this project.
<i>Decree 8987</i>	29/09/2012	Prohibition of employment of minors under the age of 18 in work that may harm their health, safety or morals	Adhere to the requirements of this decree with regards to employment for this project.
<i>Decree 11802</i>	30/01/2004	Organizes prevention, safety and occupational health in all institutions subject to the Labor Law	Adhere to the requirements of this decree in terms of occupational health of staff working on the project
<i>Law 400</i>	05/06/2002	Allows the Government to ratify the Minimum Age Convention C-138, 1973	Adhere to the provisions of the convention in terms of prohibition of work to children less than 15 years of age
<i>Law 335</i>	02/08/2001	Allows the Government to ratify the Worst Forms of Child Labor Convention C-182, 1999 (Ratification of ILO convention)	Adhere to the provisions of the convention in terms of prohibition of work which is likely to harm the health, safety or morals of children
<i>Law 28</i>	10/02/2017	The right to access information.	Every person, natural or legal, has the right to access and review the information and documents held by the administration, in accordance with the provisions of this law, taking into account that the right is not abused.
<i>Labor Law</i>	23/09/1946	Labor law and its amendments	Adhere to provisions of the law and its amendments related to employment contracts, employment of children and women; work hours and holidays, wages, dismissal, inspection, health and safety.
<i>Penal Code 340</i>	01/03/1943	Penal code	Abide by Article 522
<i>Decree 6940</i>	08/09/2020	Determining the minutes of implementing Law No. 28 of 10/02/2017	-
<i>Law 205</i>	30/12/2020	This aims to criminalize sexual harassment and help its victims	In case of any sexual harassment in the workplace, this laws protects people subjected to sexual harassment and punish the perpetrators.
<i>Traffic-related legislation</i>			
<i>Law 243</i>	25/10/2012	New traffic law	Adhere to requirements of this Law with regards to traffic movement of construction-related equipment, re-routing schemes, design of road signage, etc.

2.3 World Bank Policies

In addition to the Lebanese legislation, two safeguards policies apply to Lebanon Road and Employment Project (1) OP 4.01 Environmental Assessment and OP 4.12 and (2) Involuntary Resettlement.

2.3.1. *Safeguard Policies*

OP 4.01 Environmental Assessment.

The ESMP for the selected roads in Koura should comply with the safeguard policy of the World Bank, specifically, the OP/BP 4.01 regarding Environmental Assessment. The OP 4.01 is triggered as the project could have impacts on the environment due to the maintenance of roads.

Under the requirements of OP4.01, the proposed project is classified as Category B. Simple and low/moderate cost mitigation measures will be sufficient to restore the potential damage or keep it to the lowest possible since the environmental impacts are expected to be minimal, during the maintenance phase, and can be mitigated via an environmental management plan.

OP 4.12 Involuntary Resettlement.

Despite that OP 4.12 was triggered by this project, in the case of Koura and in accordance with site specific design plans, involuntary resettlement or land acquisition will not take place. As the project will be implemented primarily within the existing “right of way” there will be no displaced persons by the project activities (this includes local, street vendors and Syrian refugees).

2.3.2. *Access to Information (AI) policy*

Introduced in 2010, the World Bank’s Policy on Access to Information (AI Policy) has made the Bank a more effective development partner. Based on the concept that any information in the Bank’s possession is public, except for that which falls under a defined list of exceptions, the AI Policy remains the standard for international development institutions. It has also provided the basis for the accompanying open initiatives—including Open Data, Open Finances, the Open Knowledge Repository, and the Open Archives—all of which make the Bank’s work more transparent, accessible, and accountable.

2.3.3. *EHS guidelines*

The preparation of this ESMP considered the WBG Environmental Health and Safety General Guidelines which are consistent with the CDR Safety, Health, and Environmental Regulations for Construction Projects.

2.3.4. *Consultation and Disclosure Policy*

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

3 PROJECT DESCRIPTION

The selection of road sections was based on a number of criteria that considers the pavement and safety condition of the road, the level of traffic, the balancing of roads between regions and communities, the balancing of road sections by categories (primary, secondary, and tertiary), and the labor creation potential with broader socioeconomic impacts. Using these criteria, several roads were selected in the Koura Caza for maintenance, and minor construction. The land acquisition did not occur during the design of any road under study. Activities to be performed vary between one road and the other, depending on the road rating in terms of the condition of the pavement, shoulders, potential flooding and drainage, potential landslide/soil erosion and retaining walls, and/or pedestrian walkways.

Annex A includes details about type of equipment used and their technical environmental specifications (air emission levels, noise levels, vibration levels, etc.), activities management and staffing, and expected number of Labors. This annex also comprises maps of the roads location and the surrounding villages and/or towns.

3.1 Location

A general layout of the selected roads for maintenance in the Koura Caza is presented in Figure 3-1 including International roads ranging from one lane in each direction with low traffic volume to multiple lanes in each direction with high traffic density known as Highways. The location and coordinates of the selected roads for maintenance in addition to key characteristic features or potential sensitive receptors are presented in Table 3-1.

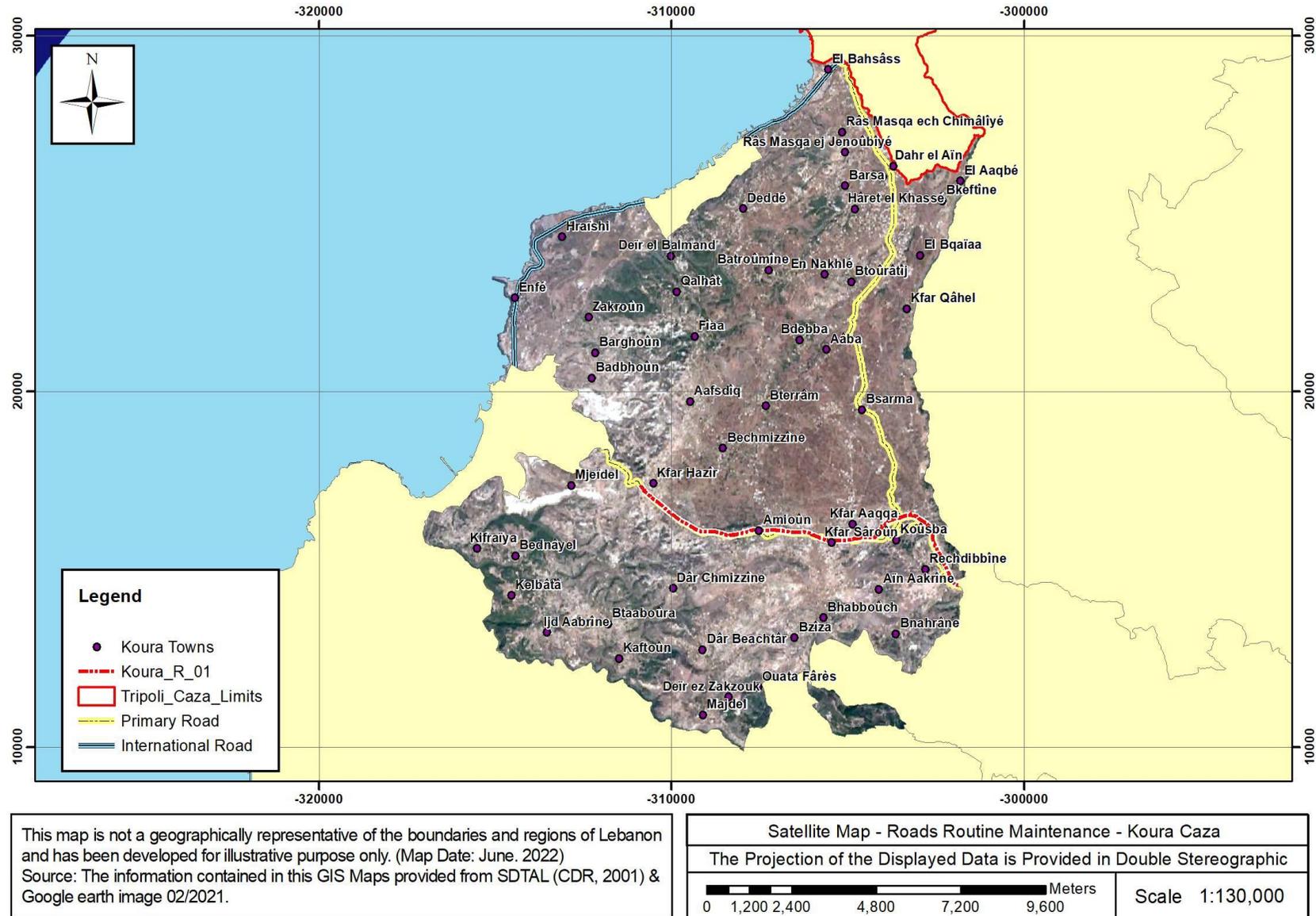
Table 3-1 Location and characteristics of Koura district selected roads for maintenance

Road code	Villages: From to	Coordinates		Classification	Length (Km)	Width range (m)	Elevation range (m)	Key features
		Start	End					
Road	Kfar Hazir – Amioun – Ffaraaka – Kousba – Rechdibbine – Moghr El Ahwal	34°18'34.91"N	34°17'13.77"N	Primary	11	5-7	334 - 636	Residential and commercial area, public and private schools, few agricultural activities

The road extends for 11 km. It passes through the following regions: Kfar Hazir – Amioun – Ffaraaka – Kousba – Rechdibbine – Moghr El Ahwal. See figure 2-1 Annex B (administrative map)

Still, depending on the quantities of maintenance works required to these selected primary roads, the remaining of funds and contract duration; other secondary selected roads may be included to the maintenance and in this case the ESMP shall be updated accordingly. In this case, the same E&S safeguards and policies applied to the primary roads will be applied to the secondary ones.

Figure 3-1 Location overview and elevation of selected roads for maintenance within the Koura district .



3.2 Project activities

The maintenance works that are expected to take place under the REP including the Koura caza may include:

- Roadway pavement by Deep & shallow pothole patching, crack sealing repair
- milling and overlay of localized pavement depressions such as failed pavement applied over utility trenches/ depressions repair
- damaged reinforced concrete retaining walls/Footwalls/ Masonry Walls repair
- Sidewalk including tiles, curbstones repair
- Safety barriers: New Jersey/ Texas barrier and steel guardrail repair
- Storm water drainage network repair
- Lighting Networks and all related electrical and civil works repair
- Road marking & signing implementation
- Other ancillary associated works including traffic management during maintenance.

The following tasks shall also be presented separately for each road:

- Reference road layout plan based on an aerial map,
- Select photos reflecting defects of selected roads and the required maintenance works,
- Assess the existing roads conditions and the required maintenance works, this shall cover the following:
 - Travel Way & Shoulder including road pavements.
 - Roadsides stability, including retaining system and slope protection
 - Drainage networks and the related pipes and box culverts
 - Traffic Control & service facilities
- Propose methodology for the required maintenance works in conformity with the relevant manual and standards,
- Require preventive measures,
- Propose materials for roadway Maintenance

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

In case the works imply any temporary closure of the road, the project contractor will assign alternative routes to secure traffic and reach relevant destinations. Detours and diversions were not included in the design. Therefore, before the execution of maintenance works, the contractor based on the schedule of works and if needed, will secure the access and traffic movement via other alternative routes and means in coordination with the related Municipality. Accordingly, all detours will be on existing alternative roads (public domain properties) and there is no need to use or rent some land to create the detour. The duration of the project is 18 months with a one -year liability period.

4 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

The preparation of the ESMP report included field surveys to observe and document baseline conditions. Information related to coverage deemed important in the context of the ESMP was synthesized and processed to prepare the maps presented in this report. Field observations coupled with reported literature form the basis for defining the physical, biological, and social characteristics of the general project area as outlined below. See figure 2-2 Annex B – Topographical map of the project.

4.1 Physical environment

4.1.1 Topography

The proposed road in the Koura Caza vary in elevation between 334m and 636m ASL. The primary road starts at Kfar Hazir at an elevation of 42m above seas level, passes through Amioun, Kfaraaka, Kousba, and Rechdibbine until it reaches an elevation of 636m ASL at Moghr El Ahwal where it ends. The road was mainly a two-way highway with no steep slopes along the way. See figure 2-2 Annex B – Topographical map of the project.

4.1.2 Geology

4.1.2.1 Lithology and main geological formations

The main geological units outcropping in the Amioun (Koura) area are the chalky to marly limestones of the Chekka Formation (C6), and the limestones and marly limestones of the Maameltain Formation (C5), as per the geological map in Figure 2-3 in Annex B, adapted from Wetzel (1945). With respect to the Cretaceous layers, in the upper end it ranges from Marl, which is an aquitard (Senonian C6) with 200 m depth to the Limestone dolomite (Turonian Cenomanian C4-C5) that is an excellent aquifer. The latter sometimes reaches up to 600 m in thickness and outcrops throughout the Koura Basin and Amioun outcrop. Also, a Miocene sequence of both massive limestone (m2) and alterations of marl, sandy limestone and conglomerates (mL1), outcrop in Amioune, Kfar Hazir, Bechmizzine, and Btourram (Figure 2-3 in Annex B). In addition, a major accumulation of fluvial puddingstones (limestone, dolomite, chert and sand pebbles) cover the area to the northeast of Amioune. Towards the east at Kousba, there is an anticline that is bounded to the west by a flexure that ends in what is called the Koura-Zgharta Basin. The Kousba-Zgharta basin is a lowered structure formed by multiple faults. This basin is covered by the “mL1” unit, which is an alteration of marl, sandy limestone and conglomerates. The mean estimated transmissivity for the Miocene in the Koura-Zgharta aquifer has been reported to be 6.4×10^{-4} m²/s (geometric average), with a range between 5.8×10^{-5} and 6.4×10^{-2} m²/s (Khayat, 2001). To the northwest of Raskifa (shown in a red circle in the geological map), the cliffs of the m2 massif limestone unit are potential sources of rock fragments. Slumps may occur in the “C6” marl as well generating slope failures, which may in some segments reach the road heading from Moghr Al Ahoual and Rechdibbine to the north.

The main lithology and formations crossed by the roads are presented in the geological map in Annex B. Moreover, the distribution of these formations within a 50 m buffer of the road are shown in table 3-1 (Annex B). As can be seen in the table, the road crosses predominantly

through the Miocene conglomerates/ limestones and through the marly limestones of the Chekka formation.

4.1.2.2 Faults, erosion, landslides, and earthquakes

The geology map in Annex B shows the faults and erosion risk in the Koura district, the road studied was not prone to any erosion risks. Seismic risks in the study area exist, given that it lies along the 1,000-km-long left-lateral Levant fault system (LFS). This fault system is responsible for a significant number of seismic events in the eastern Mediterranean (Hujeir et al., 2011). Note that two earthquakes with a magnitude of 3.5 on Richter's scale were recorded in Koura between 2001 and 2010, namely the Bechmezzine earthquake on May 6 2006 and the Majdel El Koura earthquake on 7 June 2003 (MOE, 2011). Moreover, the nearest fault to the primary road is more than 1.2 km away. For the study area, the EZ-FRISKTM model developed by Hujer et al. (2011) predicts that the 10% probability of peak ground accelerations (PGA) exceedance in 100 years, ranges between 0.3 and 0.35 g. With these levels of seismic hazards, civil engineering projects such as bridges should adopt reinforcement (in reinforced concrete structures) of "high seismic hazard" as established in international codes of practice (Hujeir et al., 2011). With regards to landslides, the middle section of the road appears to be vulnerable.

4.1.3 *Hydrology*

The study area is characterized by the presence of some springs and underground water wells (shown in Figure 2-4, Hydrogeology Map – Annex B) with no major permanent rivers crossing the proposed road. The primary road starts at the village of Ras Maska and falls in the vicinity of Wadi Barsa. Flow in Wadi Barsa has been estimated to range between 0.83 m³/sec and 19.5 m³/sec, depending on the season (UNDP, 2014). No surface water quality samples appear to have been collected along Wadi Barsa. Drinking water for most villages in the caza is still obtained mostly from groundwater wells. The depth to groundwater along Wadi Barsa was estimated to range between 120 and 130 m (UNDP, 2014). The aquifer is considered to be stressed by saltwater intrusion along the coastline. A new partially completed water network is being implemented that will feed the villages with potable water from the Kousba Water Treatment Plant. The plant is fed by water sources from the Qadisha River (Abou Ali). Note that large sections of the Koura region, particularly close to the shore, are currently undergoing several water supply infrastructure projects that are being executed and funded through CDR or USAID. Finally, a major source of domestic water is Jradeh Spring is distributed among various villages in Koura district. With regards to wastewater, ongoing projects in the Koura caza are aiming to construct wastewater gravity conveyors that can be linked to the existing Tripoli wastewater treatment plant. In most locations, secondary collectors and household connections have already been executed (CDR, 2018).

Other roads in the Caza may intersect with Wadi Asfour that is categorized as a main seasonal stream flowing towards the sea at from east to west. The most dominant hydrogeological formation located at the northern side of the Caza is the reef limestone (Miocene) with moderate high transmissivity and the next dominant hydrogeological formation that are found in the middle is marl and larly limestone C6 with a very week transmissivity. (see table 4-1 in Annex B).

4.1.4 *Climate and meteorology*

The climate and meteorological parameters play an important role in the transport and dispersion of pollutants in the atmosphere. Moreover, climate and meteorology play a role in the timing of construction activities and potential road closures during both the maintenance and operational phases. As such, meteorological data on precipitation, temperature, wind direction and speed are important for the assessment of environmental impacts. Wind speeds and wind directions are responsible for carrying pollutants from the selected roads for maintenance to nearby communities both during the maintenance and operation phases. On the other hand, precipitation controls the rates of runoff. Meteorological data for the study region are best represented through long term monitoring stations in that region. While there are no monitoring stations in the immediate vicinity of the selected roads for maintenance, data from the entire of Lebanon have recently been synthesized in the context of climate change modeling (El-Samra et al. 2018) which can be relied upon to some extent to provide general guidelines of what to expect in terms of meteorology in the project area (present and future). The duration, quality, and exhaustiveness of several climatic data sources (Atlas Climatique du Liban; NOAA's National Climatic Data Center, Lebanese National Meteorological Services (LNMS), Lebanese Agricultural Research Institute (LARI), American University of Beirut Advancing Research Enabling Communities Center (AREC)) were assessed to identify the spatial and temporal climatic data that can be relied upon albeit the variation in span and quality.

The closest station to the selected roads for maintenance is in Tripoli. Long-term average representative precipitation and temperature for the Koura Caza are presented in Figure 5-1 and 5-2 in Annex B, respectively. While precipitation is negligible in the summer season between the months of June and September, the highest precipitation is recorded for the month of January. The total precipitation in Koura, like the rest of Lebanon, shows large variability across years and locations. The wettest month precipitation is the month of January with an average rainfall of 190 mm (Figure 4-1 in Annex B). The total number of rainy days amounts to around 82 per year. No snow is recorded in the Koura caza. As for temperature, the lowest is recorded in January (average at 10°C) and the highest in August (average at 30°C) (Figure 5-2 in Annex B). With respect to wind, the closest weather station equipped with a functional anemometer is in Tripoli. The windrow over a 7-year period from that station is shown in figure 5-3 in Annex B. Predominant wind blows from the West (20 percent of the time) and South-West (10 percent of the time). Wind speed varies throughout the year from a low of 2.5 m/s to a high of 4.15 m/s.

4.1.5 *Ambient air quality and noise levels*

Traffic emissions represent the main source of air pollution in the project area with generators constituting another source in residential areas at times of electricity disconnection. Major air pollutants induced by traffic include Carbon monoxide (CO), Nitrogen Oxides (NO_x), Sulfur oxides (SO_x), Hydrocarbons (HC), and Particulate matter (PM). These pollutants are associated with potential adverse health impacts with long-term exposure to atmospheric concentrations exceeding threshold limits. Air quality monitoring in Lebanon in general is weak and adhoc with no systematic continuous monitoring. It is based mostly on individual efforts at academic institutions with a recent effort through the MoE that acquired several stations spread throughout Lebanon, particularly in urban areas. Unfortunately, the stations have stopped because of lack of resources and the existing data is not reliable because of lack of equipment calibration, to the best of our knowledge.

Annual average ambient air quality data were reported by JICA (2018) for part of the Koura Caza (Figure 6-1 in Annex B). Data for Cells 1 and 8 are considered to be representative, being close to this study area in terms of distance as well as prevalent socio-economic activities. Cells 1 and 8 represents the inland sections the highlighted main road, the surrounding secondary road and branches also fall in these 2 sections. Table 6-1 (Annex B) shows that the annual concentrations for all criteria air pollutants for cells 1 and 8 are below the national ambient air quality standards defined by MOE Decision 16/1 dated 2022. Note that the source of the data reported in JICA (2018) was not clearly stated.

Similarly, vehicles and some generators in residential areas constitute the main source of noise. While no noise measurements are available along the selected roads for maintenance, various studies have been conducted on noise measurements in specific projects / studies although no systematic noise monitoring in the country exists. In the context of the proposed road two distinct zones are identified, (1) an urban residential zone at the start of the primary road in Ras Maska crossing Dahr El Ain reaching Bturatij and (2) mostly comprising of olive trees and few residential areas, along the remaining stretches of the road (Btouratij, Bsarma til Kousba). At the primary road (Ras Maska – Dahr El Ain – Btouratij – Bsarma – Kousba) it is expected that the baseline average continuous A-weighted noise levels during the daytime will vary between 59.5 to 78.7 dBA, with an average of 69 dBA. This range was deduced from noise measurements conducted in 2017 along segments of a nearby roads of similar nature in the Koura Caza (JICA 2018). Note that these levels exceed the national standards both of 30-40 dBA for rural areas and 50-60 dBA for residential area with few construction sites, commercial activities or on highway. However, as mentioned earlier, the national standards are very stringent and hard to meet along roads. Hence, it is more realistic to consider the FHWA (1997) noise criterion of 67 dBA for residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreational areas, playgrounds, parks and 72 dBA for developed lands, properties or activities.

4.1.6 Land use land cover

The land use and land cover in an area refers to both natural landscape and anthropogenic activities occupying the regions. The proposed road in the Koura Caza pass through a varying terrestrial cover that is largely rural areas. Figure 2-3 in Annex B shows the main land use land covers of the Koura Caza as well as those in the immediate vicinity of the proposed road.

As evident from the figures along the main road, Koura Caza is predominantly agricultural in nature, covered especially with olive trees (23 percent) (Figure 2-5 in Annex B).

Olive trees fall are mainly found between Kfar Hazir and Kfar Saroun. Areas like Kfar Hazir, Amioun, Kfar Saroun, Kfaraakka, and Kousba are mainly residential and commercial of medium to high density. This density becomes lower in other areas like Rechebdine, and Moghr El Ahwal as the road reaches its end at 636m ASL.

Scrubland with some dispersed bigger trees cover around 19 percent of Koura caza but are not encountered near the main road.

4.2 Biological Environment

The primary road in the Koura Caza extend within an altitude ranging between 42 and 465 m ASL, and are thus lying within the thermomediterranean vegetation zone, which extends

between 0 and 500 m altitude. Overall, the natural environment in the study area is degraded by both agricultural activity and urbanization and does not harbor any pristine habitat of conservation importance. More specifically, the natural cover along the road covers a maximum of 30 percent of the area 50 m from the roads and consists predominantly of scrubland.

4.2.1 Flora

Biodiversity in this area can be characterized according to the distinct series of vegetation and their accompanying plant communities and plant groupings. In the study area, one can identify the thermomediterranean vegetation zone (0-500 m ASL). According to the field visit and the land cover land use map (Figure 2-3 in Annex B), on the road, the prevalent natural cover was scrubland (11.4 percent) followed by clear oaks (9.7 percent) and scrublands with some dispersed bigger trees (5.6 percent). Accordingly, typical flora in the project area includes various types of garrigue vegetation, discontinuous bushy associations of the Mediterranean calcareous plateaus, dominated by Kermes oak (*Quercus calliprinos*) and dwarfshrubs (*Poterium spinosum*) (JICA, 2018). Also, the road is bordered by olive groves (*Olea europaea*), Umbrella pine trees (*Pinus pinea*) and Calibrian pine trees (*Pinus brutia*), and Evergreen cypress trees (*Cupressus sempervirens*) As for shrubs, they include false plumed-thistle (*Onopordum carduiforme* Boiss.), viscous inula (*Inula viscoa*) and thorny-broom (*Callicotome villosa*).

4.2.2 Fauna

Due to their density and difficulty of access, shrub-lands constitute a dynamic hideout for numerous reptiles (the Chameleon (*Chamaeleo chamaeleon*) and the Spur thighed Tortoise (*Testudo graeca*)), mammals, and birds (the Green Finch (*Carduelis chloris*), the Blackbird (*Turdus merula*), the Bee Eater (*Merops apiaster*), and the Masked Shrike (*Lanius nubicus*)). This habitat also probably includes the White-breasted hedgehog (*Erinaceus concolor*); Red fox (*Vulpes vulpe palaestina*); Stone Marten (*Martes foina syriaca*) and Palastine Mole-rat (*Spalax ehrenbergi*) (JICA, 2018). The latter list of species are categorized as being of least concern in the IUCN list of threatened species.

4.2.3 Ecologically Sensitive Areas

As mentioned earlier, the road proposed for maintenance do not pass in the proximity of any ecologically sensitive area.

4.3 Socioeconomic Environment

The below sub-sections present the relevant socioeconomic background for the Caza of Koura.

4.3.1 Demographic Profile

The proposed road in Koura serves several villages in the Caza, as illustrated in Figure 4.3-1. Hence, when considering the demographic profile of the study area, the population of all the villages in the Koura Caza was considered. According to the statistics provided by the Federation of Municipalities of the Koura Caza, the current total population is around 103,923

(Table 8 -1 found in Annex B). The average household size in the Koura caza is 3.8 persons, which is equivalent to the national average (CAS & ILO, 2019). Around 65 percent of the population is between 15 and 64 years old and 10 percent is aged above 65 years. The average dependency ratio is high, reaching 54 percent. School enrollment in the Koura Caza is 92.1 percent and the illiteracy rate among the population aged 10 years and above is 8.7 percent (MOPH, 2016). The reported numbers exclude Palestinian camps and Syrian refugees. As for the total number of officially registered Syrian refugees in the Koura Caza, it was reported by UNHCR (2018) to be 16,306. No Palestinian camps are present in the Caza. The total number of officially registered Syrian refugees in the villages in the immediate vicinity to the two roads was estimated at around 6,400 (UNHCR, 2018), see below related map.

Further, regarding other vulnerable groups such as female-headed households, disabled and poor household, the required data was not found through research. A detailed survey is required to find a specific data on vulnerable groups in Koura, however, such survey is out of the scope of the ESMP.

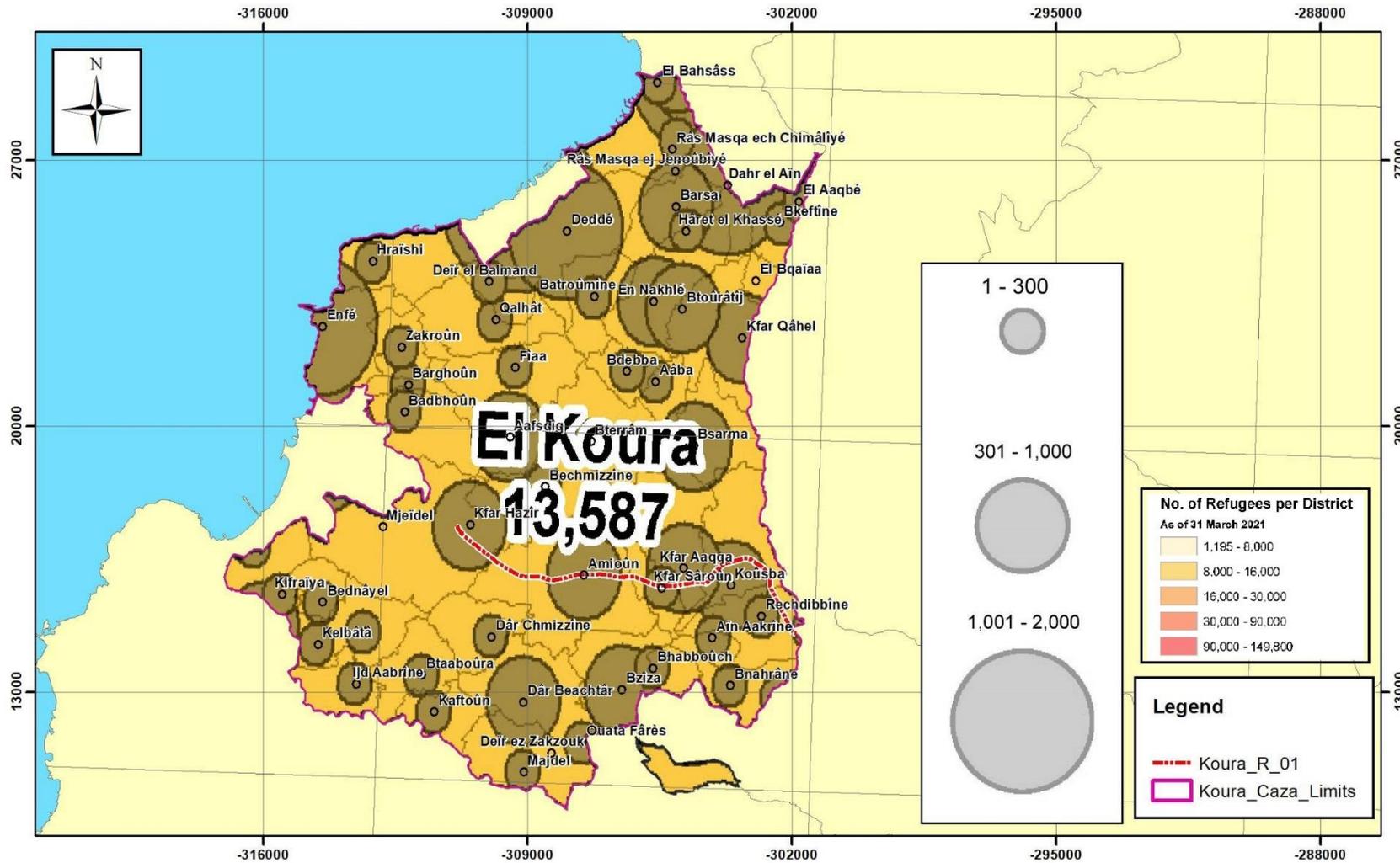
4.3.2 *Social Activities*

The Koura district has grown in the past two decades to become an educational center housing many schools and universities that attract students from various regions in the North creating an active social environment particularly around these schools and universities. Koura is also house to several hospitals and a few industries centered around the cement industry and olive oil production. Otherwise, social activities in relevant Koura villages are relatively limited to in or out of village visits between family or friends, picnics, visits to religious houses, periodic municipal or parliamentary elections, or other range of celebrations of births / anniversaries / weddings to condolences in funerals. Larger villages / towns may house a school or a clinic or an NGO. A detailed social survey at the level of each village was not conducted. To the extent available and accessible, some data was collected from reported literature and outlined below.

4.3.3 *Economic Activities*

Standard of living refers to the level of wealth, comfort, material goods, and necessities available to a certain socioeconomic class in a country. About half of the residents (44.7 percent) in the Koura caza are classified in the intermediate living index category, while 27 percent are classified as low and 28.3 percent as having high standard of living (CAS/ UNDP/ MOSA, 2004). The unemployment rate in the Koura Caza is 14.5 %, which is higher than the national average of 11.4 % (CAS & ILO, 2019). As for the poverty rate, it is estimated at 24.7 % (CDR, 2018).

Socio-economically, the land use reflects on the economic and social fabric of the region as a whole and in the areas surrounding the selected roads for maintenance. The predominant urban fabric along these roads is medium density, covering 26.6 percent of the road. In terms of agricultural activities, olive groves cover 34.5 percent of the area along the road. These are associated with dispersed light olive-related industries. Besides remaining farmers, residents in the overall caza tend to work elsewhere in urban areas along the coastal region with many residing there and visiting their villages in the summer. Evidently, this is the case for most of the Lebanese villages, where income from agriculture is not adequate to maintain livelihood and has become a supplement rather than the main source of living.



This map is not a geographically representative of the boundaries and regions of Lebanon and has been developed for illustrative purpose only. (Map Date: June, 2022)
 Source: The information contained in this GIS Maps provided from SDTAL (CDR, 2001) & UNHCR_LBN_REF_MAP_2021-03_31_Syrian Refugees Registered in Lebanon.

Syrian Refugees Distribution Map - Roads Routine Maintenance - Koura Caza
 The Projection of the Displayed Data is Provided in Double Stereographic

	Scale 1:130,000
--	-----------------

Figure 4-1 Syrian refugees distribution map in Koura Caza (UNHCR-2021)

4.3.4 Educational Services

There are several educational centers in Koura district such as private schools, public schools, and universities. However, as shown in Figure 1-3 in Annex B, only Kfar Hazir Public School, Saint Therese Amioun Highschool, and Rosarie Abdine are directly served by the proposed road to undergo maintenance works in Koura district.

4.3.5 Healthcare Services

The Koura Caza includes three private hospitals (Al Borgi, Al Koura, Albert Haykal) but no public hospitals (shown in figure 1-4 in Annex B). Only Borgi Hospital, the Lebanese Red Cross Amioun 503, and Boustany Hearig Corecrtion Center are directly served by the proposed road in Koura as they fall within 100m of it.

4.3.6 Traffic Survey

No specific data were recorded regarding traffic flow, as the proposed project is not limited to a specific location, and the type of maintenance works do not cause any blockage of the roads.

4.3.7 Road Sensitive Receptors

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

The field survey revealed that the agricultural lands along the road, in addition to the residential areas which in some cases are in direct vicinity to the road. Furthermore, the primary road passes next to the educational and healthcare centers are previously shown. Also, concerning the houses of worship, four churches were observed along the road.

There are no sites of cultural heritage significance that are located directly along the selected roads for maintenance, but some protected historical sites that are shown in figure 2-6 in Annex B.

In summary, the main sensitive receptors of concern include agricultural lands (namely olive groves) and the nearby residence and educational centers. The closest schools to the road are Kfar Hazir Public Highschool, Saint Therese Amioun High school, and Rosarie Abdine.

5 POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS

This chapter describes the environmental and social impacts that are likely to result from the maintenance of the roads. Due to the nature of the activities, the anticipated negative environmental and social impacts are expected to be minor to moderate during the maintenance phase and of temporary nature including dust, noise, waste generation, disruption to traffic and movement and possible damage to existing utilities; and of little consequence during the long-term operational phase. Such impacts can be minimized by implementing the environmental and social management plan.

The assessment methodology is attached in Annex A

5.1 Potential positive impacts during maintenance

Table 5-1 Environmental and Social Impacts for the Koura district roads during the maintenance phase

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
Environmental Impact				
Air quality	Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> ▪ Usage of construction equipment Shallow excavation ▪ Levelling works ▪ Transport vehicles delivering construction materials, ▪ Disturbances of stockpiles by winds and material handling 	Negative impact from Dust Emission	Minor negative impact
Noise	Surrounding Communities, and Fauna.	<ul style="list-style-type: none"> ▪ Use of heavy machinery ▪ Excavation and milling works ▪ Labours shouting ▪ Evacuation of materials 	Negative impact creating stress on local inhabitants, and close vicinity to road works	Moderate negative impact
Biodiversity	Surrounding Fauna and Flora	<ul style="list-style-type: none"> ▪ Dust from construction works ▪ Wastewater from construction and domestic disposal ▪ Destruction of surrounding trees and plantations ▪ Disturbance of surrounding inhabit ate with load sounds 	Negative impact that could cause loss of surrounding inhabitant	Minor negative impact
Construction waste	Biodiversity, surface and ground water and soil	Soil waste, milling materials, domestic wastes improperly disposed	Negative impact from contamination water resources and soil. Also, possible blocking of streams.	Minor negative impact
Water and soil quality	Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> ▪ Runoff and erosion from site surfaces, drainage channels, earth working areas and stockpiles; ▪ Wash water from dust control; Fuel, oil, solvents and lubricants leakage from machinery and equipment ▪ Domestic wastewater from project offices 	Negative impact from contamination water resources and soil.	Moderate negative impact
Resources consumption	Surrounding Communities, Fauna and Flora, and	<ul style="list-style-type: none"> ▪ Increase quarrying causing raw materials depletion ▪ Increase quarrying causing dust, noise, and vibrations 	Negative impact from fill and construction	Moderate negative impact

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
	Water resources.	<ul style="list-style-type: none"> ▪ Increase transportation of heavy vehicles ▪ Increase water pumping 	material, and water depletion	
Landscape and visual intrusion	Surrounding Communities	<ul style="list-style-type: none"> ▪ Soil erosion ▪ Excavation activities 	Negative impact from depletion of the vegetative cover on the side roads and visual impact on the landscape	Minor negative impact
Social Impact				
Traffic	Surrounding Communities and road users, and workers	<ul style="list-style-type: none"> ▪ Reducing traffic flow ▪ Possible temporary block of accessibility 	Negative Impact due to possible traffic congestions or accidents occurrence.	Moderate during short time negative impact
Existing infrastructure	Surrounding Communities	<ul style="list-style-type: none"> ▪ Cut-off water supply pipes ▪ Destruction of electricity cables or/and phone lines. ▪ Block of drainage channels and/or wastewater collection network 	Negative Impact due to possible loss of services	Minor during short time negative impact
Social tensions	Surrounding Communities and workers	The feeling of discrimination or harassment due to hiring of forging labours	Negative impact due to conflict over jobs or dissatisfaction	Minor to low negative impact
Child labour	Refugee and poor communities	Allowing child to work in unsafe construction environment and preventing him the right of proper education	Negative Impact due to abuse and exploitation	high during long time negative impact
Labour Influx	Women and children	Verbal and/or action harassment	Negative Impact due to possible Sexual Abuse and Exploitation and Harassment (SEA/H)	high during short time negative impact
Health and safety impacts	Surrounding Communities and road users, and workers	<ul style="list-style-type: none"> ▪ Improper traffic management ▪ Work accident due to PPE noncompliance ▪ Land obstacles and uncovers holes ▪ Speedy project heavy machineries ▪ Improper covering of pointy construction materials. 	Negative Impact due to accident occurrence	Moderate during long time negative impact

5.2 Potential Environmental impacts during the maintenance phase

During maintenance, the project is expected to have positive impacts on socio-economics. Being labor intensive, construction projects will result in job creation and in business opportunities for skilled and unskilled labor among local residents and Syrian refugees, such as construction labor and the supply of construction material and provision of food to the construction workers. Based on the past experience of construction work in the country, there is a higher probability of Syrians-refugees to apply and work in unskilled and low-skilled labor positions. The number of jobs created for roads maintenance within the Koura Caza could not

be estimated at this stage, however, compared to other similar projects, the project shall require between 10 and 20 workers.

5.3 Potential negative impacts during the operation phase

Table 5-2 Environmental and Social Impacts for the Koura district roads during the operation phase

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
Environmental Impact				
Air quality & Traffic	Surrounding Communities, Fauna and Flora, and Water resources.	Improve traffic flow that lead to improved fuel efficiency and better engine performance,	Positive impact due to reducing vehicle emissions Dust Emission	Minor to moderate positive impact
Noise	Surrounding Communities, and Fauna.	Reduce traffic congestion	Positive impact by reducing stress on local inhabitants	Minor positive impact
Water and soil quality	Surrounding Communities, Fauna and Flora, and Water resources.	Improve the water drainage collection system	Positive impact protection of water resources and soil.	Minor negative during long time impact
Landscape and visual intrusion	Surrounding Communities	Elimination of road holes, falling retaining walls and improving stress lights and guardrails	Positive impact due to the road refurbishment to improved appearance	Minor negative to positive during long time impact
Social Impact				
Traffic	Surrounding Communities and road users, and workers	Reducing traffic congestion	Positive Impact due to reducing traffic travel time.	Minor during long time positive impact
Socio-economics	Surrounding Communities and road users	<ul style="list-style-type: none"> ▪ Improve accessibility of people (including school and university students), goods and services ▪ Reduced trip times and less traffic congestion ▪ Smoother road surfaces may lead to fewer vehicle repairs 	Positive Impact due to improvement in local economic and social development and enhanced livelihood opportunities	Positive impact
Health and safety impacts	Surrounding Communities and road users, and workers	With proper maintenance and signage, the roads can be safer with less potential for accidents	Positive Impact due to of accident occurrence	Minor negative to positive

5.4 Summary of impact analysis

The maintenance phase of any development is known to have potential adverse environmental and social impacts. The potential environmental and social impacts during both phases of the project were assessed to range from minor to major negative, with the majority being moderate negative.

Table 5-3 summarizes the significance of impacts associated or expected with both the maintenance and operation phases. Negative impacts are mostly temporary or not significant in nature with similar size projects.

Table 5-3 Summary of potential impacts of selected roads for maintenance in Koura district

<i>Potential Impact</i>	<i>Maintenance phase</i>	<i>Operation phase</i>	
<i>Traffic</i>	Moderate negative	Minor negative to	Positive
<i>Air quality</i>	Minor negative	Minor negative to	Positive
<i>Noise</i>	Moderate negative	Minor negative to	Positive
<i>Biodiversity</i>	Minor negative	Minor negative	
<i>Construction Waste</i>	Minor negative	Neutral	
<i>Soil and water</i>	Moderate negative	Minor negative to Zero	
<i>Resources consumption</i>	Moderate negative	Neutral	
<i>Existing infrastructure</i>	Minor negative	Neutral to Positive	
<i>Visual Intrusion</i>	Minor negative	Minor negative to	Positive
<i>Health and Safety</i>	Moderate negative	Minor negative to	Positive
<i>Socio-Economic</i>	Moderate negative	to Positive	Positive
<i>Archaeology / Cultural Heritage</i>	Neutral	Neutral	
<i>Expropriation/involuntary resettlement</i>	Neutral	Neutral	

6 MITIGATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

Mitigation measures are typically recommended whenever the potential impact is moderately significant with the ultimate purpose to eliminate or reduce the potential negative impacts of the proposed project. Mitigation measures are highly dependent on the significance of the predicted impact, the nature of the impact (permanent vs. temporary), or the phase of the project (maintenance vs. operation). Possible measures to mitigate potential impacts described in the previous section are outlined below, particularly during the maintenance phase. The operation phase will experience mostly general socio-economic improvements which is the purpose of the project although minor impacts are inevitable such as the increase of noise and vehicle emissions due to traffic increase.

6.1 Environmental Mitigation Measures during maintenance

Table 6-1 Environmental and Social Mitigation Measures for the Koura district roads during the maintenance phase

<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Mitigation Measure</i>
Environmental Impact			
Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> ▪ Usage of construction equipment ▪ Shallow excavation ▪ Levelling works ▪ Transport vehicles delivering construction materials, ▪ Disturbances of stockpiles by winds and material handling 	Negative impact from Dust Emission	<ul style="list-style-type: none"> ▪ Ensuring adequate maintenance and repair of construction machinery and vehicles ▪ Maintaining good housekeeping practices ▪ Turning off all equipment when not in use ▪ Sprinkling water on the construction site on windy days ▪ Proper handling of cement material ▪ Covering all vehicles hauling materials ▪ Ensuring good fuel quality is used in trucks transporting construction material to and from site ▪ Ensuring optimum and regular transportation of construction materials to minimize storage of large heaps ▪ Restricting vehicle speeds to 15km/h on unpaved roads and trucks
Surrounding Communities, and Fauna.	<ul style="list-style-type: none"> ▪ Use of heavy machinery ▪ Excavation and milling works ▪ Labours shouting ▪ Evacuation of materials 	Negative impact creating stress on local inhabitants, and close vicinity to road works	Use of quiet equipment and noise mufflers, proper maintenance of equipment, and limiting noisy activities to normal daylight working hours.
Surrounding Fauna and Flora	<ul style="list-style-type: none"> ▪ Dust from construction works ▪ Wastewater from construction and domestic disposal 	Negative impact that could cause	<ul style="list-style-type: none"> ▪ Workers' movement and activities should not infringe on

<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Mitigation Measure</i>
	<ul style="list-style-type: none"> ▪ Destruction of surrounding trees and plantations Disturbance of surrounding inhabitate with load sounds	loss of surrounding inhabitant	the nearby ecosystems including agricultural areas. <ul style="list-style-type: none"> ▪ Workers should be instructed to protect flora and fauna when feasible as well as their habitats. ▪ Solid and liquid waste should not be dumped into the natural environment (See below).
Biodiversity, surface and ground water and soil	Soil waste, milling materials, domestic wastes improperly disposed	Negative impact from contamination on water resources and soil. Also, possible blocking of streams.	<ul style="list-style-type: none"> ▪ Properly dispose construction waste at suitable permitted locations by local municipalities ▪ Ensure proper handling of fuels, lubricants and other chemicals while maintaining construction equipment and prevent possible leakage. Maintain equipment in dedicated repair shops. ▪ Collect waste to hand to recycling entity
Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> ▪ Runoff and erosion from site surfaces, drainage channels, earth working areas and stockpiles; ▪ Wash water from dust control; Fuel, oil, solvents and lubricants leakage from machinery and equipment ▪ Domestic wastewater from project offices 	Negative impact from contamination on water resources and soil.	<ul style="list-style-type: none"> ▪ Building materials, asphalt, oil, fuel and chemicals should be stored away from river banks in well controlled areas ▪ Any stockpiled construction material should be covered with an impermeable layer ▪ All refueling operations shall take place off-site. ▪ Each container should be marked with the correct technical name of the substance it contains ▪ A spill response plan shall be in place and all workers should be trained on its implementation ▪ Used or waste fuel or other waste chemicals shall be stored in an isolated area until collected for off-site disposal by an approved waste contractor ▪ Vehicle and equipment wash-down should only be done in designated areas. ▪ A collection system shall be provided under any machinery or equipment that may leak hydrocarbons (e.g. mobile generator)
Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> ▪ Increase quarrying causing raw materials depletion ▪ Increase quarrying causing dust, noise, and vibrations ▪ Increase transportation of heavy vehicles 	Negative impact from fill and construction material,	<ul style="list-style-type: none"> ▪ Using water-efficient equipment during maintenance operations to avoid excessive and overuse of water ▪ Recording monthly fuel consumption.

<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Mitigation Measure</i>
	<ul style="list-style-type: none"> Increase water pumping 	and water depletion	<ul style="list-style-type: none"> Dry clean-up methods should replace wet cleaning methods to reduce water consumption Appropriate plastic sheeting or waterproof paper should be used to cover the concrete after water curing to preserve moisture and reduce the evaporation Turn off equipment when not in use Regularly maintain machinery and generators Do not leave vehicles idle for long periods Site offices shall be well insulated to retain heat or cool, Reuse excavated material whenever feasible Accept construction material only from permitted quarrying sites
Surrounding Communities	<ul style="list-style-type: none"> Soil erosion Excavation activities 	Negative impact from depletion of the vegetative cover on the side roads and visual impact on the landscape	<ul style="list-style-type: none"> Documenting existing conditions prior to initiation of the works Preserving existing vegetation when feasible Restoring depleted vegetative cover by replanting with endemic trees (pine, oak, etc.) where cutting is necessary during maintenance. Clearance of all equipment, spoil heaps, and other materials after construction Ensuring that lights are turned off when not needed
Social Impact			
Surrounding Communities and road users, and workers	<ul style="list-style-type: none"> Reducing traffic flow Possible temporary block of accessibility 	Negative Impact due possible traffic congestions or accidents occurrence.	<ul style="list-style-type: none"> Scheduling transportation of construction material during off -peak traffic hours and during night time. Informing the public about the schedule of maintenance activities Maintaining access to roadside businesses and Ensuring adequate warning, signing, delineation and channeling Providing personnel to manage traffic at the maintenance site, supported by Municipal police if needed Ensure the GRM is readily available for use by sensitive receptors

<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Mitigation Measure</i>
Surrounding Communities	<ul style="list-style-type: none"> ▪ Cut-off water supply pipes ▪ Destruction of electricity cables or/and phone lines. ▪ Block of drainage channels and/or wastewater collection network 	Negative Impact due to possible loss of services	<ul style="list-style-type: none"> ▪ Avoid damaging any possible existing infrastructure and try to obtain plans prior to commencement of any maintenance works. ▪ Procedures for rapid notification in the case of disruption of any existing utility, ▪ Immediate assistance with re-instatement, and close follow-up with concerned authorities.
Surrounding Communities and workers	The feeling of discrimination or harassment due to hiring of forging labours	Negative impact due to conflict over jobs or dissatisfaction	<ul style="list-style-type: none"> ▪ Keep close coordination with municipal authorities to avoid any tension escalation and provide working vacancy for local community ▪ Ensure requirements in CoCs are clearly understood. ▪ Ensure that the sanctions embodied in the CoC are be clearly explained. ▪ Verify that GRM is adequately implemented
Refugee and poor communities	Allowing child to work in unsafe construction environment and preventing him the right of proper education	Negative Impact due to abuse and exploitation	Prevent any child labour and keep close monitoring to avoid any similar action
Women and children	Verbal and/or action harassment	Negative Impact due to possible Sexual Abuse and Exploitation and Harassment (SEA/H)	Provide workers with the necessary training and awareness raising session on issues regarding SEA/H, prior to signing the CoC.
Surrounding Communities and road users, and workers	<ul style="list-style-type: none"> ▪ Improper traffic management ▪ Work accident due to PPE noncompliance ▪ Land obstacles and uncovers holes ▪ Speedy project heavy machineries ▪ Improper covering of pointy construction materials. 	Negative Impact due to accident occurrence	<ul style="list-style-type: none"> ▪ Work within work zone only ▪ Comply with the standard safety, health and environmental regulations of the CDR and the WB. ▪ Installing proper warning signs, ▪ Providing personnel protective clothing and equipment PPEs.
Health and Safety			
Surrounding Communities and road users, and workers	Accident and injuries to workers and public because of maintenance activities	Negative Impact due to accident occurrence	<ul style="list-style-type: none"> ▪ Develop a site-specific Public Health and Safety Plan and Occupational Health and Safety (Annex E)

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

Effective mitigation and monitoring plans require the presence of adequate capacity for environmental management at the national level. For the REP, the CDR plays a major role in ensuring the implementation of environmental mitigations by:

Table 7-1 Environmental and Social Monitoring Plan for the Koura district roads during the maintenance phase

<i>Impact</i>	<i>Monitoring indicators</i>	<i>Responsibility</i>	<i>Frequency/ Duration</i>	<i>Location</i>	<i>Methods</i>	<i>Estimated Cost¹</i>
<i>Traffic</i>	Periodic site inspection by traffic expert with documentation and photos of mitigation measures (traffic management plan-TMP)	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	TMP experts employment salary of about \$1,500/month salary
<i>Air quality</i>	Periodic site inspection by EHS expert with documentation and photos of mitigation measures (vehicle and excavation emissions, turning off of equipment not in use, equipment maintenance, ect)	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	Total Suspended Particles (TSP), PM ₁₀ , PM _{2.5} (wherever feasible), SO _x , NO _x and CO	Contractor under supervision of the Consultant	Upon public complaint	At site and at sensitive receptors within 100 m from site	1-hr measurements, and visual observation of dust dispersion (scale and direction)	1,800\$/event
<i>Noise</i>	Periodic site inspection by EHS expert with documentation and photos of mitigation measures (equipment mufflers, equipment maintenance, equipment turned etc) and measurements of indicators in case of public complaints	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	L _{eq} , L _{min} and L _{max}	Contractor under supervision of the Consultant	Upon public complaint	At site and at sensitive receptors within 100 m from site	Single sample per location (average 1hr reading-15min intervals) during morning (7-8am), evening (1-2pm) and night (4-5pm)	500\$/ event
<i>Construction</i>	Periodic site inspection by EHS expert	Contractor under	Daily	At maintenance	Visual observation and	Environmental,

Impact	Monitoring indicators	Responsibility	Frequency/ Duration	Location	Methods	Estimated Cost¹
<i>and other solid waste</i>	with documentation while maintaining a record of waste generation, collection, segregation, storage, transportation and disposal in terms of type, quantity, and disposal location of generated waste	supervision of the Consultant		site	documentation with photos	Health & Safety, and Social EHS expert employment salary of about \$2,500/month
<i>Runoff water/ drainage</i>	Periodic site inspection by EHS expert with documentation	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	Water quality analysis	Contractor under supervision of the Consultant	Upon public complaint	At nearby river/ stream	Totals suspended solids, BOD, COD, Oil and grease	1000\$/ event
<i>Resource consumption</i>	Periodic site inspection by EHS expert with documentation of excavated material, water and energy conservation practices and design elements	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
<i>Existing infrastructure</i>	Periodic site inspection by EHS expert with documentation of excavation works and response to disruption of underground utilities	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
<i>Visual intrusion</i>	Periodic site inspection by EHS expert with documentation of excavation and re-planting / re-vegetation while checking on culverts particularly following rainfall events	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
<i>Health and Safety</i>	Periodic site inspection by EHS expert with documentation (PPE, site enclosure, buffer zones, warning signs, first aid kit), while maintaining a record	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment

<i>Impact</i>	<i>Monitoring indicators</i>	<i>Responsibility</i>	<i>Frequency/ Duration</i>	<i>Location</i>	<i>Methods</i>	<i>Estimated Cost¹</i>
	of injuries					salary of about \$2,500/month
<i>Socio-economic</i>	Periodic site inspection by EHS expert with documentation of employment and grievance, sharing construction schedule with the public, access to roadside businesses, vendors and residences, and grievance record. Documentation of training and raising awareness for SEA/H and signing of the CoC as well as record of age verification against child labor.	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month

7.1.1 Training

In the context of the proposed project that encompasses simple maintenance activities, environmental management during the maintenance and operation activities are relatively simple to ensure environmental protection. This can be accomplished through competent personnel with appropriate educational and professional background and instituting a periodic training program and site-specific plans that are adequate for protecting the general public and the environment as well as contributing to the mitigation of potential environmental impacts. Thus, contractors who will be involved in the construction of the proposed project as well as personnel who will be involved in monitoring activities from the supervising Consultant may attend an environmental training workshop prior to the initiation of project activities. Relevant staff from the concerned municipalities are encouraged to attend, as they will be indirectly supervising the works on the ground. The objective of this training is to ensure appropriate environmental awareness, knowledge and skills for the implementation of environmental mitigation measures. Environmental training sessions will be conducted twice a year for a period of one day during the maintenance phase. The training program will emphasize on pollution prevention measures and techniques during both phases. The cost and schedule of this training program will be 2,000 USD per day including material preparation. Repeat workshops will be at 1,000 USD per day. The training program will cover at least the following topics:

- ❑ Environmental laws, regulations, and standards
- ❑ Pollution health impacts
- ❑ Pollution prevention measures
- ❑ Sampling techniques and environmental monitoring guidelines (air, noise, water)
- ❑ Protection of cultural heritage in developmental projects
- ❑ Traffic and pedestrian safety measures
- ❑ Code of conduct for laborers and interactions with nearby communities
- ❑ Awareness sessions about internal GRM for workers

7.1.2 Reporting

Progress reporting on safeguards compliance will take place as indicated in the ESMF (CDR, 2018) and listed below:

- ❑ Contractor's environmental compliance reports to the Environmental Supervision Consultant on monthly basis;
- ❑ Environmental Supervision Consultant reviews and approves the contractor reports and submits to the PIU at the CDR Roads and Transport Department on monthly basis
- ❑ PIU environmental/social progress reports to the WB, on a quarterly basis. (This will be part of the quarterly project progress report produced by the PIU).

7.1.3 Documentation and Reporting

During the maintenance phase, the Supervising Consultant shall submit a monthly report about the monitoring activities to various stakeholders including the CDR and the municipalities. These reports shall be made readily available or accessible to the public upon submittal. The content of a typical report should mirror the indicators of the mitigation plan with proper documentation with photos and actions taken in the event of accidents, concerns or complaints.

7.1.4 Guidelines for Health and Safety Plan during maintenance

During maintenance, the contractor shall abide by the CDR Safety, Health, and Environmental Regulations for Construction Projects (Annex C) as well as the IFC Environmental Health and Safety General Guidelines.

8 CONSULTATION, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

8.1 Public Consultation

A public consultation meeting was conducted on at the Federation of Municipalities in the Koura Caza in Amioun. The number of attendees was 17 with 3 females. The attendees included 11 heads of municipalities in the Koura Caza, 5 members of municipal boards of villages in the Caza, the Secretary of Union Municipalities of Koura, and 1 contractor. An online public consultation was held on February 23, 2022 with a number of NGOs operating mainly at the North of Lebanon Governance. Many NGOs were invited by few attended the meeting on Google Team (list is presented in Annex F).

Figure 8-1 Public participation session with Koura Caza stakeholders



It is worth mentioning here that all relevant municipalities will be informed upfront before the commencement of works about the Project since public consultation was conducted back in February 2022. In addition, a public notice will be posted at each relevant municipality including the GRM procedure. This will disseminate the Project and ensure that its activities are implemented in a transparent manner.

The main issues raised by the attendees were as follows.

- The concerned municipalities want to see the roads design maps to provide their opinion on the proposed maintenance elements. It was agreed that this can be accommodated in

subsequent meetings upon the request of the Federation either with the Consultant's Engineer or with the Contractor prior to initiation of construction activities.

- Enforcing construction schedule in a timely fashion.
- Public concerns should be respected during project execution.
- Using construction material that is of good quality and that does not deteriorate rapidly, as per the agreed terms of reference.
- Contractor to give priority employment to local people from the towns where the roads maintenance is taking place.

Employment opportunities were discussed for both Lebanese and Syrian workers. The latter contributes significantly in the construction sector throughout Lebanon including the Koura District. Besides private entities, the municipalities are resorting to Syrian labor in this sector in particular. There appears to be a clear split in job types between local communities. The delineation line is between skilled jobs (mainly taken by the Lebanese workforce) and unskilled labor (filled primarily by Syrian workers). This split has resulted in a control of potential tensions or conflict between the communities.

No disputable issues were raised from the NGO's side on the project components, however; all discussion was related to the type of works, the funder, the duration and the executer of the project. All requested explanation were tackled as the presenter mentioned that this project is WB funded project and it is part of REP that is already executing a rehabilitation activates, will extend for two years and can be extendable depending on the funds availability, and the contractor is not yet selected waiting for the tendering procedure to completed.

8.2 Grievance Redress Mechanism

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 PIU. 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 maintenance sites in Koura Caza, before commencement of project implementation. Moreover, the information on how to access the GRM should be available through CDR website, etc.

As well, the contract will have to coordinate with the relevant municipalities prior to the works commencement to disseminate the availability of a GRM to the public and affected communities. The social expert of the contractor is responsible for addressing and explaining the grievances arising from to the municipality officials and the surrounding communities. The experts will make sure to clarify that in the occurrence of any Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) (SEA/SH) complaints, these will be immediately reported to the CDR who will in turn report to the World Bank.

The GRM levels of the project are the following:

- 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 maintained in Koura 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.

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

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

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

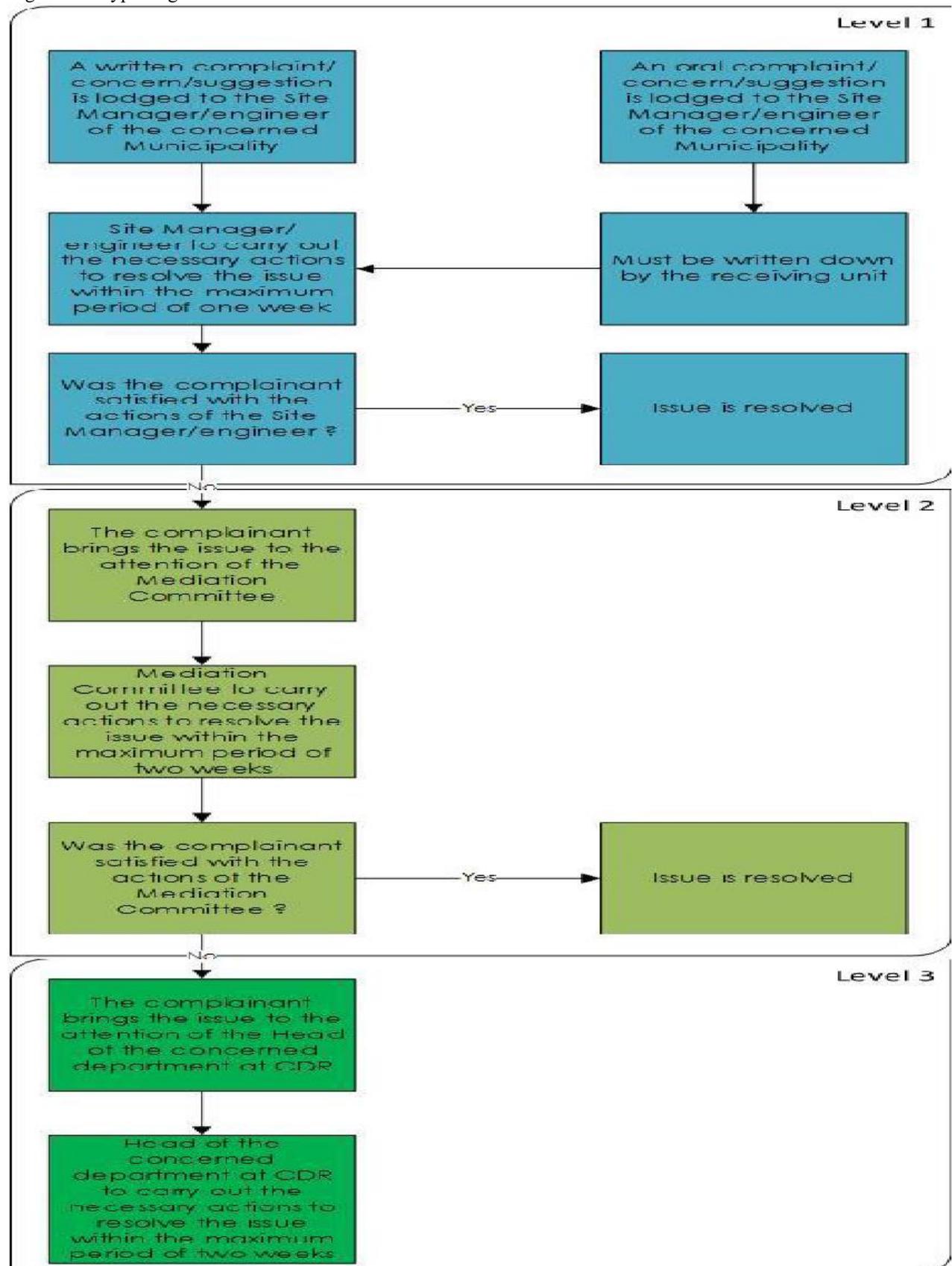
The GRM does not exclude the formal legal process of the national law. If a grievance remains unresolved following application of the project GRM process, the affected person can initiate legal proceedings in accordance with national law and may have recourse to the Appeals Court as warranted.

Figure 8-2 (overleaf) presents a detailed flowchart describing the process of grievance starting from reception of grievance to implementation of corrective measures.

8.2.2 GRM for Workers

A GRM for internal employees, namely the laborers onsite are also necessary. It aims to allow 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 F).

Figure 8-2 Typical grievance redresses mechanism for the REP



Source: CDR, 20

9 REFERENCES

- Abdallah C. 2007. Application of remote sensing and geographical information system for the study of mass movements in Lebanon. Tectonics. Université Pierre et Marie Curie - Paris VI.
- Abi-Saleh B., Nazih N., Hanna R., Safi N., Tohme H. 1996. Etude de la Diversité Biologique du Liban; Vol. 3. MOA/PNUE, Beyrouth.
- Canter, L.W. 1995. Environmental impact assessment. McGraw-Hill, New York.
- CAS & ILO. 2019. Labour Force and Household Living Conditions Survey (LFH LCS) 2018–2019 Lebanon. Funded by the European Union.
- CAS, UNDP and MoSA. 2004. Living Conditions and Household Budget Survey.
- CDR. 2018. Environmental and Social Management Framework for the Roads and Employment Project. Republic of Lebanon.
- CDR. 2018a. EuropeAid/138081/IH/WKS/LB. Works contract prior information notice wastewater works in Koura Caza North of Lebanon, Beirut, Lebanon.
- De Nevers, N. 2000. Air Pollution Control Engineering. McGraw-Hill Inc., New York.
- Dubertret M., Wetzel M., 1945. Carte Geologique detaille au 1:50,000, feuille de Qartaba, Liban. Delegation Generale de France au Levant, Beirut.
- Dubertret M., 1949. Carte Geologique detaille au 1:50,000, feuille de Baalbek, Liban. Delegation Generale de France au Levant, Beirut.
- Dubertret M., 1951. Carte Geologique detaille au 1:50,000, feuille de Sir Ed Danie, Liban. Delegation Generale de France au Levant, Beirut.
- El Haber, R. 2000. Horsh Ehden Forest Nature Reserve. Beirut: St. Paul Imp.
- Federal Highway Administration (FHWA). 1997. Procedures for abatement of highway traffic noise and construction noise-23 CFR PART 772. Online. Available: <http://www.fhwa.dot.gov/environment/23cfr772.htm#table1>.
- Huijer C., Harajli M. and Sadek S. 2011. Upgrading the seismic hazard of Lebanon in light of the recent discovery of the offshore thrust fault system. Lebanese Science Journal, Vol. 12, No. 2.
- JICA. 2018. Initial Environmental Examination (IEE) Report Annex No. 12 Koura Caza. Prepared by Geoflint, January 2018.
- Kassem, Y., Gökçekuş, H. & Zeitoun. 2019. Modeling of techno-economic assessment on wind energy potential at three selected coastal regions in Lebanon. M. Model. Earth Syst. Environ. 5: 1037. <https://doi.org/10.1007/s40808-019-00589-9>
- Khayat, Z. 2001. Groundwater conditions in the Koura-Zgharta Miocene limestone aquifer, Lebanon: Department of Geology, American University of Beirut.
- Ministry of Agriculture/UNEP. 1996. Biological Diversity of Lebanon. Country Study Report, Project. GEF/6105-92-72. Comprehensive report, 9, 255.
- Ministry of Environment. 2001. State and Trends of the Lebanese Environment. Beirut. Lebanon.
- Ministry of Public Health. 2016. Statistical Bulletin 2016. Online. Available: <https://www.moph.gov.lb/en/Pages/8/327/statistical-bulletins>
- Rich C. and Longcore T. 2006. Ecological consequences of artificial night lighting. Island Press, Washington, D.C.
- Salem, S. 2014. Assessing the Environmental Impacts of Work Zones in Arterial Improvement Projects (No. N14-16). TranLIVE.
- Sbayti, H. 2000. Air pollution modeling of transport-related emissions in the Solidere area. M.S. thesis, Department of Civil and Environmental Engineering, American University of Beirut, Lebanon.
- Supe S.M. Gawande. 2013. Effect of dust fall on vegetation. International Journal of Science and Research (IJSR) 4: 2319 7064.
- The World Bank Group. 2019. Climate Change Knowledge Portal. [Online] Available at: http://sdwebx.worldbank.org/climateportal/index.cfm?page=country_historical_climate&ThisCCCode=LBN

- UNDP 1970. Liban etude des eaux souterraines. New York, 186 p.
- UNDP. 2014. Assessment of Groundwater resources of Lebanon. Beirut, Lebanon
- UNHCR. 2018. Distribution of the registered Syrian refugees at the Cadastral level. North Governorate, Tripoli, Batroun, Bcharreh, El Koura, El Minieh-Dennieh, Zgharta Districts. Online. Available: <https://data2.unhcr.org/en/documents/download/62225>.
- Wetzel M. 1945. Carte Geologique detaille au 1:50,000, feuille de Tripoli, Liban. Delegation Generale de France au Levant, Beirut.
- World Bank. 2002. The World Bank Policy on Disclosure of Information. June 2002. The World Bank, Washington D.C.

ANNEX A: PROJECT DESCRIPTION

1. Material and Equipment

The following are the types of construction equipment which may be used. Other equipment may be added as needed by the site activities.

Table 1-1-1 Materials and equipment to be used during maintenance

<i>Material</i>	<i>Equipment</i>
Aggregates for concrete, base and asphalt mix	Compressors and excavators
Ordinary Portland cement	Tractor
Sulphate-resisting cement	Motor blade grader
60-70 pen and liquid asphalt	Generators
Steel reinforcement	Crane mobiles
Timber	Dumper
Manhole frames	Lorry
RC pipes	Water sprayer and asphalt sprayer
Agricultural soil and grass seed	Concrete mixer and steel roller
	Portable pump and soil compactor

The Contractor will not install on-site any plants for asphalt and concrete batch and will be getting his required quantities from already existing licensed plants located near the maintenance activity.

2. Site Staffing

At this stage, the final number of workers needed for the REP in Caza of Koura is based on estimation since the total volume of each activity as per the bill of quantities of the tender documents is not prepared yet by the awarded Contractor. Therefore, it is estimated that the maintenance works would require the workforce of 10 to 20 laborers.

3. Site Facilities

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

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 staff 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 maintenance 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 emptying the tank when filled 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.

4. Equipment used and their technical environmental specifications

XA(H,V,T)S 106-186 Deutz Oil-injected rotary screw compressors



The XA(H,V,T)S 106-186 range of portable air compressors from Atlas Copco

All compressors are manufactured in accordance with Atlas Copco's Quality and Environment Management System. This system complies fully with ISO 9001 and ISO 14001. All Atlas Copco compressors are tested to perform under the most demanding conditions.

Features	Benefits
Full compliance with 2000/14/EC, the latest European Outdoor Noise Directive	Units can be operated in the vicinity of hospitals, schools, residential areas and even at night and comply with international legislation
Compliant with exhaust emission standards 97/68/EC step II (Europe) & EPA Tier II (U.S.)	Meets the strictest environmental requirements

Technical data

Compressor data

Type	Actual free air delivery (1)	Normal effective working pressure	Compressor oil system capacity	Sound power level (2)	Sound pressure level (3)	Maximum ambient temperature	Air outlet valves
	l/s	bar(e)	l	dB(A)		°C	
XAS 126 altitude	128	7	14.5	101	73	50	1x11/2" and 3x3/4"
XA(S) 136	135	7	14.5	101	73	50	1x11/2" and 3x3/4"
XA(S) 136 DdG	103	7	14.5	101	73	50	1x11/2" and 3x3/4"
XA(S) 186	185	7	24	101	73	50	1x11/2" and 3x3/4"
XATS 116	113	10.3	14.5	101	73	50	1x11/2" and 3x3/4"
XATS 156	166	10.3	24	100	72	50	1x11/2" and 3x3/4"
XAHS 106	101	12	14.5	101	73	50	1x11/2" and 3x3/4"

XAHS 146	141	12	24	100	72	50	1x11/2" and 3x3/4"
XAHS 186	175	12	24	101	73	45	1x11/2" and 3x3/4"
XAVS 136	133	14	24	100	72	50	1x11/2" and 3x3/4"

- (1) According to ISO 1217 edition 3 1996 annex D
- (2) According to 2000/14 EC, guaranteed sound power level
- (3) According to ISO 2151 from 7 m

Bobcat S450



Environmental Specifications

Operator LpA(98/37 & 474-1) 87 dB(A)
 Noise level LWA(EU Directive 2000/14/EC) 101 dB(A)
 Whole body vibration (ISO 2631-1) High speed 1.29 ms⁻²
 Whole body vibration uncertainty 0.52 ms⁻²
 Hand-arm vibration (ISO 5349-1) High speed 1.73 ms⁻²

ANNEX B: BASELINE ENVIRONMENTAL AND SOCIAL DATA

1. Roads Photos

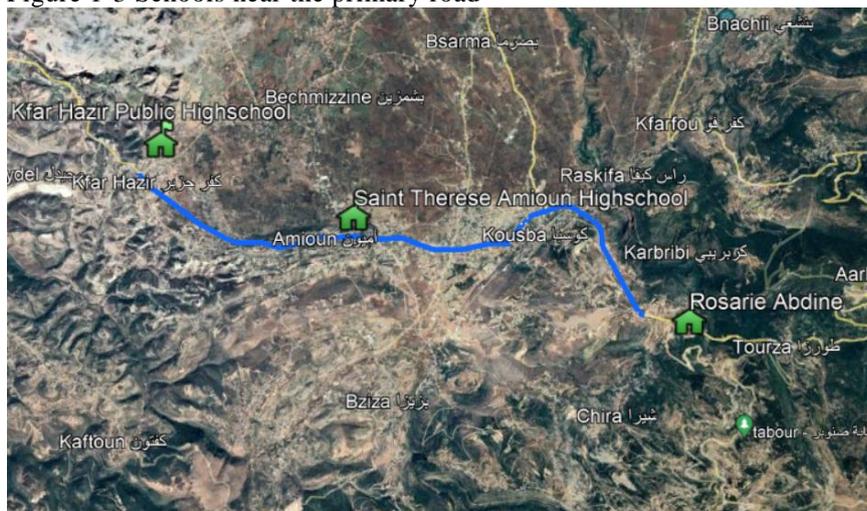
Figure 1-1 Sideways of the Primary Road



Figure 1-2 Typical vegetation along Road



Figure 1-3 Schools near the primary road



2. Roads Maps

Figure 2-1 Topographical map of the Koura district

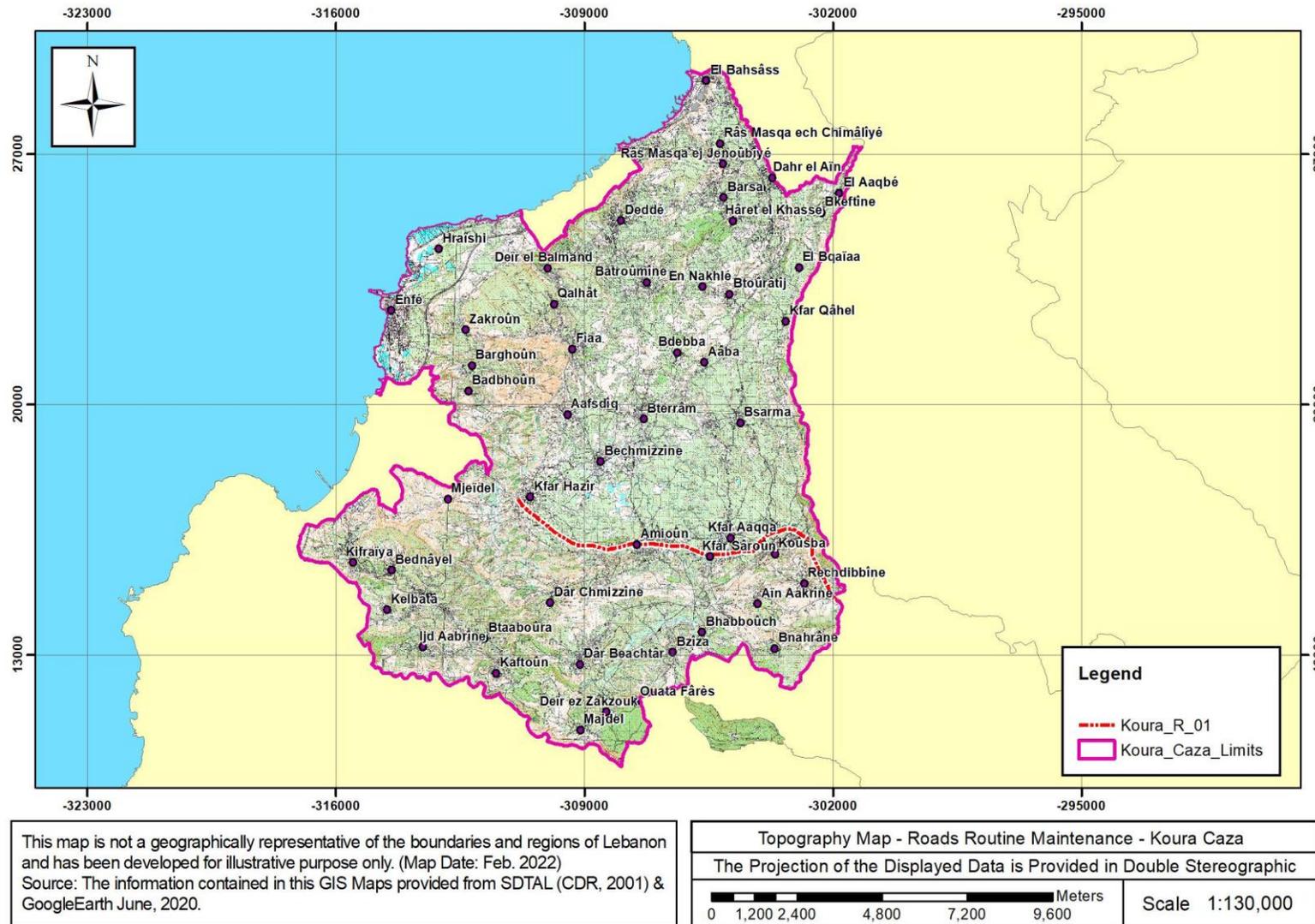
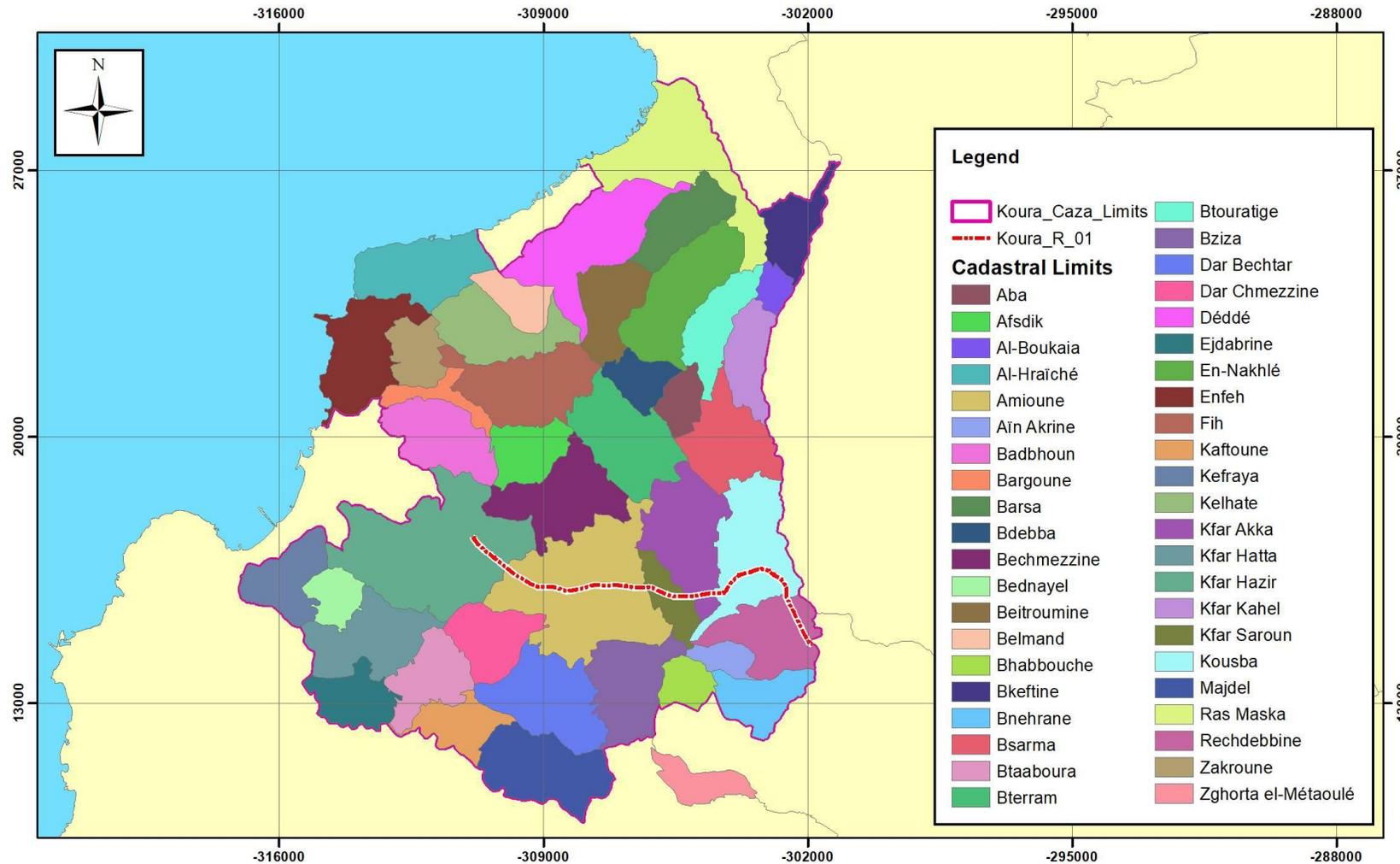


Figure 2-Administrative map of the Koura district



This map is not a geographically representative of the boundaries and regions of Lebanon and has been developed for illustrative purpose only. (Map Date: Feb. 2022)
 Source: The information contained in this GIS Maps provided from SDTAL (CDR, 2001) & GoogleEarth June, 2020.

Administrative Map - Roads Routine Maintenance - Koura Caza

The Projection of the Displayed Data is Provided in Double Stereographic

	Scale 1:130,000
--	-----------------

Figure 2-3 Geological map of the Koura district

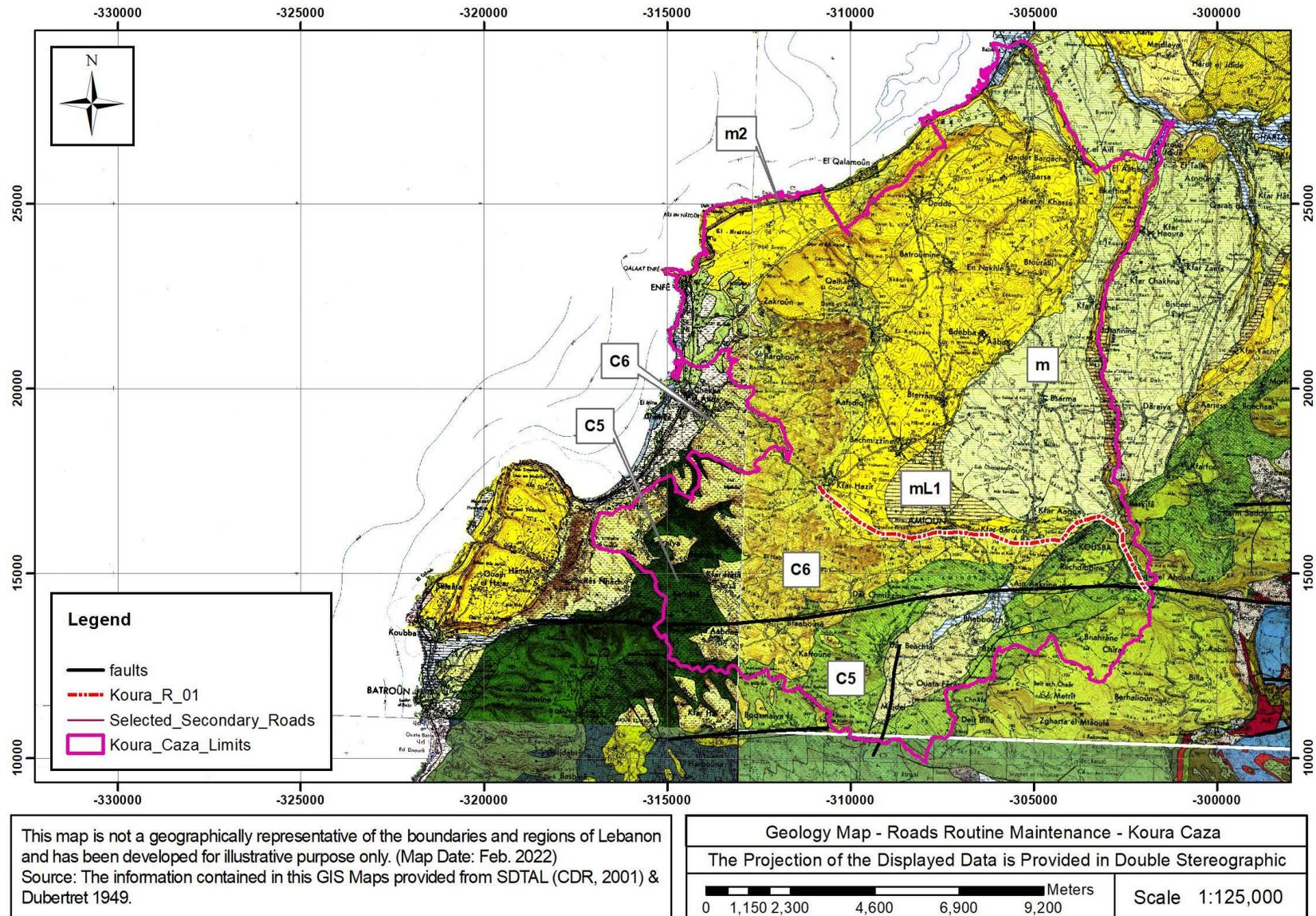


Figure 2-4 Hydrology and Hydrogeology of Koura district

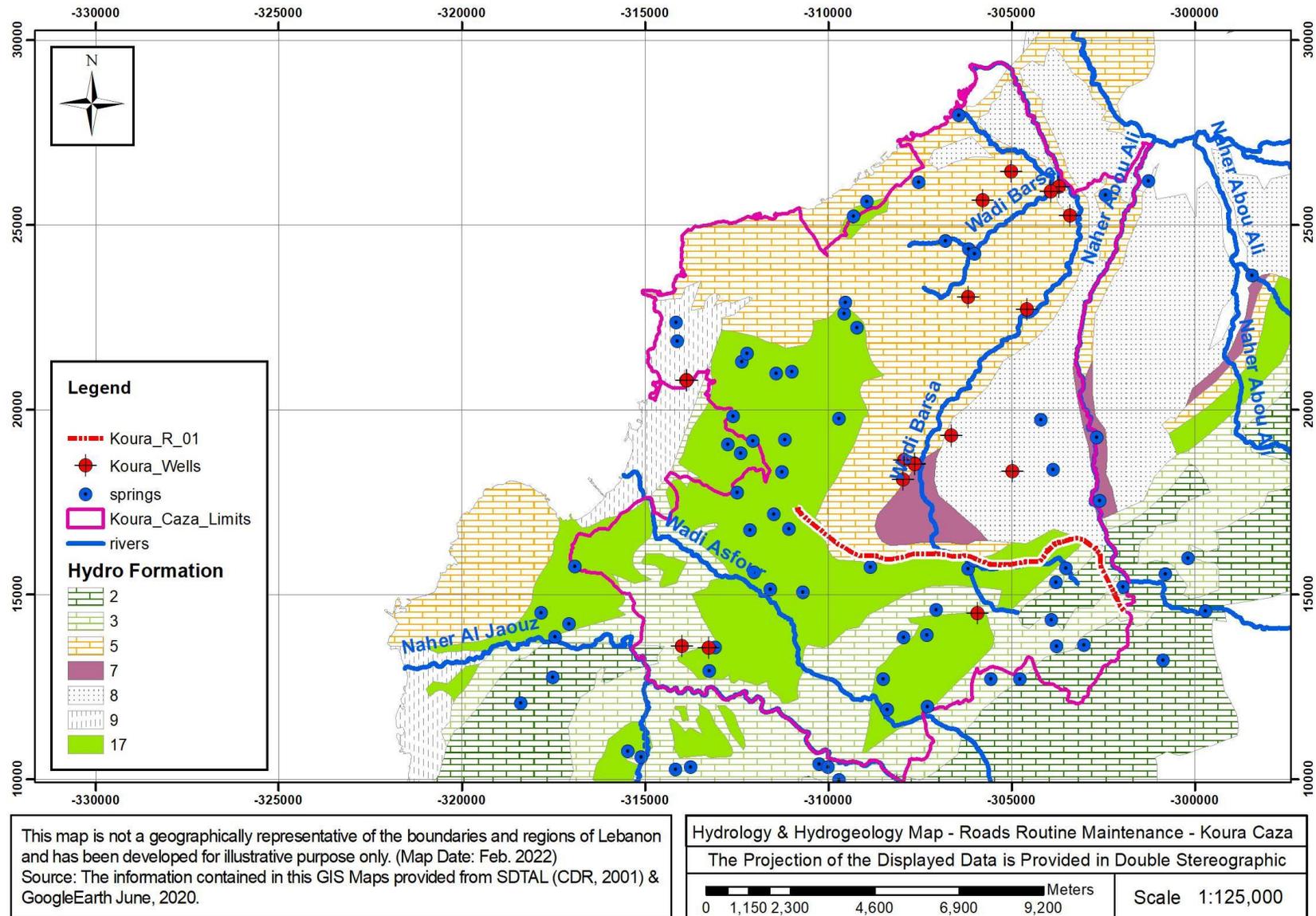
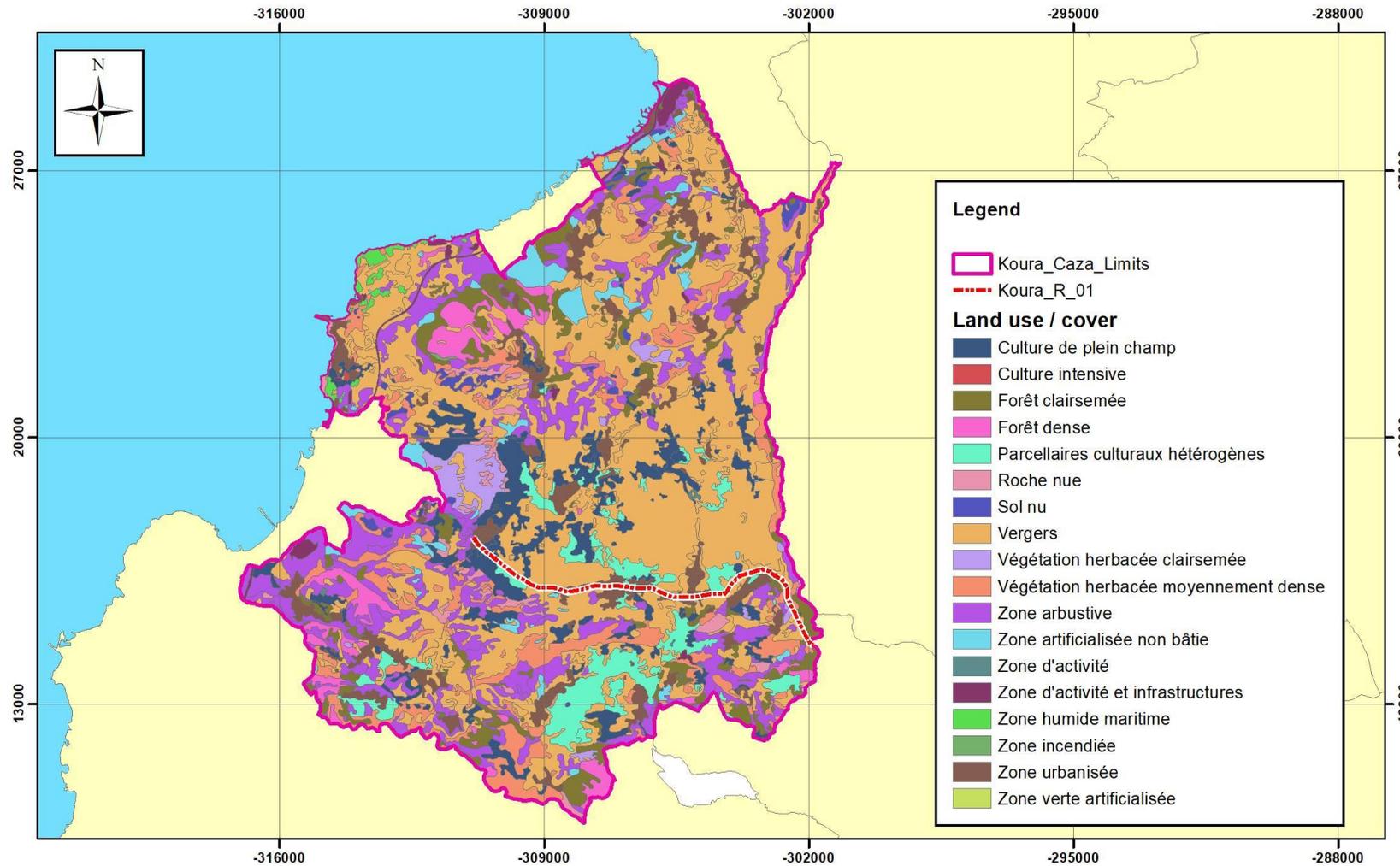


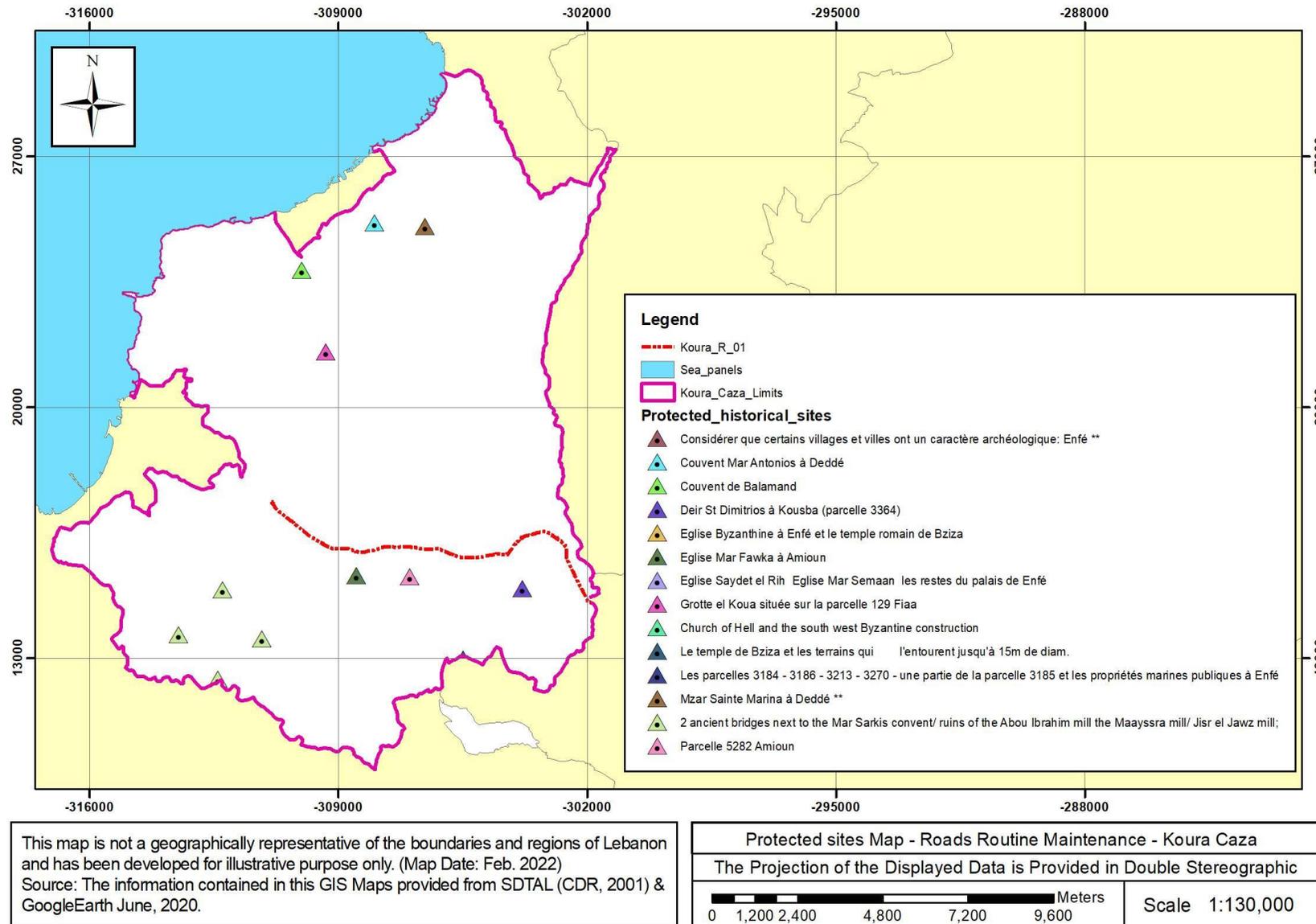
Figure 2-5 Land use / Land Cover of Koura district



This map is not a geographically representative of the boundaries and regions of Lebanon and has been developed for illustrative purpose only. (Map Date: Feb. 2022)
 Source: The information contained in this GIS Maps provided from SDTAL (CDR, 2001) & GoogleEarth June, 2020.

Land use / cover Map - Roads Routine Maintenance - Koura Caza	
The Projection of the Displayed Data is Provided in Double Stereographic	
	Scale 1:130,000

Figure 2-6 Protected areas of Koura district



3. Geology Description

Table 3-1 Main lithology and formations crossed by proposed roads

Road	Name	Lithology	Formation	Percentage (%)
Koura District Roads	Miocene	Conglomerates/limestone	Miocene	48
	Quaternary	Recent deposits	Quaternary	13
	Senonian	Marly limestone/chalk	Chekka	39

4. Hydro-geology Description

Table 4-1 Main lithology and formations crossed by proposed roads

Geology Class	UNDERGROUND SHEETS OF WATER	LITHOLOGIE	AGE	FLOWS OF the SOURCES I/sec.	PROBABLE INSTANTANEOUS FLOWS OF THE WORKS I/sec.	Transmissivity m ² /sec
		FACIES				
2	IN KARSTIC FORMATIONS Wide and rich watertable	Limestone regularly bedding Thickness: 800 à 1000 m.	CRETACE Cénomanién -Turonien	<100 100-1000 >1000	>100	10 ⁻² ≤ T ≤ 1 Generally high
3		Limestone and marly limestone beds of flint Thickness: ~ 200m.	CRETACE Turonien	100-1000 >1000	>100	Generally high
5		Reef limestone thickness: 200 to 250 m.	NEOGENE Miocène	100-1000	<100	Often High
7	Water Table extended	Coarse conglomerate torrential - marly conglomerates Thickness: 500 to 600 m.		NEOGENE Miocène et Pliocène (faciès continental)	<100 OR DISCHARGES DIFFUSE DISPERSEE	<30
8		Alluvions anciennes		QUATERNAI RE	DIFFUSE DISCHARGE	<30
9		Silt and "terra rossa" Thickness: 600 m.	QUATERN AIRE	DIFFUSE DISCHARGE	<10	Poor with weak very changing
17	AREAS GENERALLY WITHOUT WATER TABLE OR A VERY LOCAL WATER TABLE	Marl and marl-limestone thickness: 100 to 200 m.	CRETACE Sénonien et base de l'Eocène	-	Very weak	Very weak

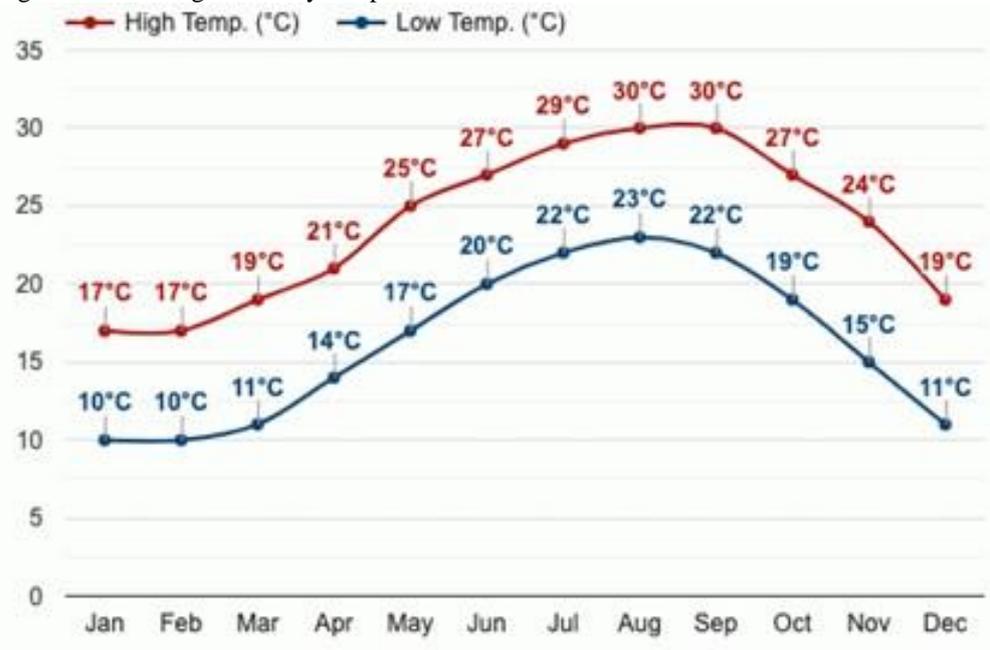
5. Climate and meteorology

Figure 5-1 Average monthly rainfall values for Koura district



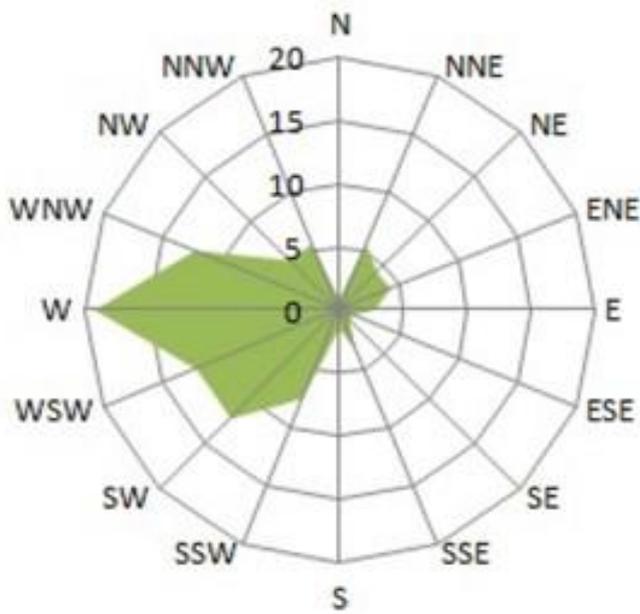
Source: <https://www.weather-atlas.com/en/lebanon/tripoli-climate>

Figure 5-2 Average monthly temperature values for Koura district



Source: <https://www.weather-atlas.com/en/lebanon/tripoli-climate>

Figure 5-3 Wind speed and wind direction from the Tripoli weather station over a 7-year period (2010–2016)



Source: Kassem et al. 2019

6. Ambient air

Figure 6-1 Air quality cells as per the JICA (2018)



Source: JICA 2018

Table 6-1 Average annual ambient concentrations of air pollutants in the Koura district

<i>Pollutant</i>	<i>National ambient air quality standards (MOE Decision 52/1)</i>		
	<i>Cell 1</i>	<i>Cell 8</i>	
PM _{2.5}	16.8	19.6	80 µg/m ³
PM ₁₀	20.0	24.0	120 µg/m ³
CO	328.0	580	10,000 µg/m ³
SO ₂	13.8	23.8	80 µg/m ³
NO ₂	19.5	35.4	100 µg/m ³
O ₃	78.8	68.4	100 µg/m ³

Source: JICA 2018

Impact assessment Methodology

The process of impact assessment is undertaken taking into consideration direct, indirect, planned or unplanned (accidental) impacts during the Project's construction (maintenance) and operation phases. Identified potential impacts are assessed for overall significance based on consequence and likelihood ranking where the impact significance is expressed as the product of the consequence and likelihood of occurrence of the activity as outlined below.

Significance = Consequence x Likelihood

Where "Consequence" is the resultant effect (positive or negative) of an activity's interaction with the legal, natural and/or socio-economic environments. "Likelihood" is the possibility that an impact will occur.

The assignment of the level of consequence and potential likelihood depends on the professional experience and judgment of the study team. This judgement followed the consequence categories defined in Table 6-2. The potential overall consequence is then combined with the "Likelihood" to give the impact significance as presented in Table 6-3, which illustrates the likelihood scores and the resulting significance based on consequence-likelihood interaction.

Table 6-2 Consequence Scores

<i>Consequence Score</i>	<i>From Planned Activities</i>	<i>From Unplanned/ Accidental Activities</i>
5 (Severe)	Severe environmental damage or severe nuisance extending over a large area and continuous emission or permanent change over more than 5 years. Likely major breach in compliance resulting in prosecution. Stakeholders concern is triggered on an international level.	Certain (event likely to occur more than once on the facility)
4 (High)	Continuous emission or permanent change over less than 5 years leading to a major impact. Possible major regulatory noncompliance. Stakeholders concern is triggered on a national level.	Possible (could occur within the lifetime of the development)

<i>Consequence Score</i>	<i>From Planned Activities</i>	<i>From Unplanned/ Accidental Activities</i>
3 <i>(Medium)</i>	Regular over short-term (less than 3 years) or intermittent over long-term (more than 3 years) leading to repeated breaches of statutory limit. Spontaneous recovery of limited damage within one year. Possible regulatory noncompliance. Stakeholders concern is triggered on a regional level.	Unlikely (event could occur within the life of 10 similar facilities, has occurred at similar facilities)
2 <i>(Low)</i>	Minor magnitude effect on the environment but no permanent effect. Regulatory terms or corporate policy set defined conditions. Stakeholders concern is triggered on a local level.	Remote (similar event has occurred somewhere with similar projects but not likely to occur with current practices and procedures)
1 <i>(Negligible)</i>	Local environmental damage within the fence and within systems with negligible severity. No specific statutory control. Stakeholders concern is triggered on an individual level.	Extremely remote (has never occurred within similar projects but theoretically possibly)
0 <i>(None)</i>	No impact.	-
+ <i>(Positive)</i>	Beneficial impact that enhances the environment. No public interest or improves aspect of community importance.	-

Table 6-3 Significance categories based on consequence-likelihood interaction

<i>Significance = Consequence x Likelihood</i>							
<i>Consequence</i>	<i>Likelihood</i>						<i>Significance</i>
	5	4	3	2	1	0	
	<i>Certain</i>	<i>Possible</i>	<i>Likely</i>	<i>Unlikely</i>	<i>Extremely Remote</i>	<i>Will Not Occur</i>	
5	25	20	15	10	5	0	Severe
4	20	16	12	8	4	0	Major
3	15	12	9	6	3	0	Moderate
2	10	8	6	4	2	0	Minor
1	5	4	3	2	1	0	Negligible
0	0	0	0	0	0	0	No Impact
+							Positive Impact

Methodology for estimating impact on air quality

Maintenance phase

Heavy construction is a source of dust emissions that may have substantial temporary impact on local air quality. Road construction is an example of a construction activity with high

emissions potential. Emissions during the construction of a road in general, and the REP in particular, are a function of the excavation scheme, and the machinery used on-site. Emissions will consist primarily of particulate dust matter released as a result of earth removal activities, and to a lesser extent of emissions from the on-site usage of heavy construction equipment. Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing meteorological conditions. A large portion of the emissions results from equipment traffic over temporary roads at the construction site. For this phase, it is expected that negative impacts on air quality will occur in and around the immediate vicinity of the site under construction. In order to quantify this impact, the total construction emissions and the corresponding ambient particulate matter concentration were estimated as described below.

Estimation of the total construction emissions using the area wide method.

In this method, the quantity of particulate matter emissions from maintenance operations is considered proportional to the area being worked and to the level of construction activity. Emissions from heavy construction operations are positively correlated with the silt content of the soil (particles with a diameter <75 micrometers [μm]), as well as with the speed and weight of the average vehicle, and negatively correlated with the soil moisture content. An approximate aerial emission factor (EF) for the construction activities that is used in the estimation of total emissions (USEPA, 1995) is:

$$EF = 0.3 \text{ Kg/m}^2/\text{month of activity}'$$

Assuming the road maintenance will take place in various spots and that a 10 m road section will be maintained per spot, the temporal emission factor for the total construction area of 10-20 m² and a duration of 4 days of activity, considering 6 working days/month and 8 hours/day of work is:

$$S = 0.3 \times (10-20) / (0.13 \times 6 \times 8 \times 3600)$$

$$S = 0.000133- 0.000267 \text{ Kg/s} = 133,000-267,000 \text{ }\mu\text{g/s}$$

Note that a better method is to estimate emissions for a particular site, the maintenance process be broken down into component operations, each involving traffic and material movement. However, due to the random nature of activities, and lack of specific design data, the extent of PM impact may differ from the quantified emission using this method.

7. Land use / Land cover

Table 7-1 Summary of the main land use land cover within Koura Caza

<i>Road</i>	<i>Land use land cover</i>
Primary Road	Citrus Fruit Trees

	Clear Grasslands
	Clear Oaks
	Dense Oaks
	Dense Pines
	Abandoned Agriculture Lands
	Field Crops in Medium to Large Terrace
	Field Crops in Small Fields/Terrace
	Highway
	Olives
	Protected Agriculture
	Rocky Outcrops
	Scrubland with Some Dispersed Bigger Trees
	Urban Sprawl on Field Crops
	Urban Sprawl on Permanent Crops
	Industrial or Commercial Areas
	Urban Extension and/or Construction Sites

8. Socioeconomic Environment

Table 8-1 Population size in the Koura Caza in 2016

<i>Village</i>	<i>Population</i>
Amioun	10,000-12,000
Anfeh	5,793 (in 1998)
Almajdel	1,200
Btourateej	8,000
Batroumine	1,300
Bednayel	750
Barsa	9,000
Bziza	1,500
Bsarma	-
Btourram	2,250
Bkifteen	1,100
Darshmezzine	700
Darbeachtar	4,500
Rashdabeen	1,500
Aafsadeek	1,300
Fiaa	2,500
Qalhat	-
Kaftoun	-
Kfarhata	2,000
Kfarhazir	4,000
Kfarsaroun	2,200
Kfaraaqa	5,200
Kousba	9,000
Ain aakrine	1,500
Ajdaabarine	1,750
Bdbba	1,300
Bechmezzine	1,000
Didde	20,000
Mitreet	1,600
Kefraya	1,980
Aaba	-

<i>Village</i>	<i>Population</i>
<i>Total</i>	<i>102,923-104,923</i>

(Federation of Municipalities in Koura Caza, 2019)

ANNEX C: ESMP CHECKLISTS

Table C 1 ESMP Risk Classification Criteria Checklist

Criteria	YES / NO	Description
Subproject is classified as Category A according to World Bank classification.	No	The subproject is classified as Category B according to the World Bank classification.
Subproject activities have significant adverse environmental or social impacts that are sensitive, diverse, or unprecedented.	No	Not likely as the project is targeting slight construction activities.
Activities affect an area broader than the sites or facilities subject to physical works	No	The project activities include only maintenance works; therefore, this criterion may not be applicable.
Subproject will result in conversion/alteration of natural habitats	No	As the selected alignments are already altered with existing roads and only requires maintenance, there should not be any new type alterations.
Generation of significant quantities of hazardous waste	No	Depending on the type of activities and machinery used during maintenance, the hazardous wastes will be further evaluated during the field activities.
Will the sub-project trigger a new World Bank Policy other than OP4.01 and OP4.12?	No	The policy is not part of the scope of work due to the estimated level of work.
Will the sub-project increase the footprint or includes new construction of roads?	No	The project activities include only maintenance, temporary and are localized.
Subproject Project is Eligible to be financed under REP	YES	-

Checklist of Possible Environmental and Social Impacts of Projects

Table C 2 Subcomponent Related Issues

S No	ISSUES	YES	NO	Comments
A. Zoning and Land Use Planning				
1.	Will the subproject affect land use zoning and planning or conflict with prevalent land use patterns?		x	The project activities include only maintenance, are temporary and localized.
2.	Will the subproject involve significant land disturbance or site clearance?		x	
3.	Will the subproject land be subject to potential encroachment by urban or industrial use or located in an area intended for urban or industrial development?		x	
B. Utilities and Facilities				
4.	Will the subproject require the setting up of ancillary production facilities?		x	Since the activities are only road maintenance, this issue is not addressed.
5.	Will the subproject require significant levels of accommodation or service amenities to support the workforce during construction (e.g., contractor will need more than 20 workers)?		x	No accommodation will be available due to the Covid-19 restrictions.
C. Water and Soil Contamination				
6.	Will the subproject require large amounts of raw materials or construction materials?		x	The project activities should not require large quantities of raw or construction materials

S No	ISSUES	YES	NO	Comments
				since maintenance activities that are limited will be conducted.
7.	Will the subproject generate large amounts of residual wastes, construction material waste or cause soil erosion?		x	But will depend on the type of works.
8.	Will the subproject result in potential soil or water contamination (e.g., from oil, grease and fuel from equipment yards)?		x	This issue depends on the machinery or equipment used.
9.	Will the subproject lead to contamination of ground and surface waters by herbicides for vegetation control and chemicals (e.g., calcium chloride) for dust control?		x	Any contamination that may occur is not advisable and should be controlled in case a potential risk arises.
10.	Will the subproject lead to an increase in suspended sediments in streams affected by road cut erosion, decline in water quality and increased sedimentation downstream?		x	Any risk of pollution that may occur is not advisable and should be controlled in case a potential risk arises.
11.	Will the subproject involve the use of chemicals or solvents?		x	The type of chemicals/solvents that may be used depend on the maintenance activity.
12.	Will the subproject lead to the destruction of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards?		x	The type of work will not lead these kinds of issues based on site fields.
13.	Will the subproject lead to the creation of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors?		x	The project activities include only maintenance, are temporary, therefore it is expected to cause such issues.
D. Noise and Air Pollution Hazardous Substances				
14.	Will the subproject increase the levels of harmful air emissions?	x		Air emissions are possible, but should be controlled.
15.	Will the subproject increase ambient noise levels?	x		An increase in noise levels is expected, but their effect should be minimized through the proper use of PPEs and silencers in the machines. However, their effect is not expected of great significance since the work activities are temporary.
16.	Will the subproject involve the storage, handling or transport of hazardous substances?		x	Yet this depends on the type of activities and machinery used during maintenance, the hazardous wastes will be further evaluated.
E. Fauna and Flora				
18.	Will the subproject involve the disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes)?		x	Based on the site visit, there will be no modifications or disturbances.
19.	Will the subproject lead to the destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development?		x	Since the activities are only road maintenance, this issue will not be addressed.
20.	Will the subproject lead to the disruption/destruction of wildlife through interruption of migratory routes, disturbance of wildlife habitats, and noise-related problems?		x	Since the activities are only road maintenance, this issue will not be addressed.

S No	ISSUES	YES	NO	Comments
F. Destruction/Disruption of Land and Vegetation				
21.	Will the subproject lead to unplanned use of the infrastructure being developed?		x	Since the activities are only road maintenance, this issue will not be addressed.
22.	Will the subproject lead to long-term or semi-permanent destruction of soils in cleared areas not suited for agriculture?		x	Since the activities are only road maintenance, this issue will not be addressed.
23.	Will the subproject lead to the interruption of subsoil and overland drainage patterns (in areas of cuts and fills)?		x	Since the activities are only road maintenance, this issue will not be addressed.
24.	Will the subproject lead to landslides, slumps, slips and other mass movements in road cuts?		x	Since the activities are only road maintenance, this issue will not be addressed.
25.	Will the subproject lead to erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains?		x	Since the activities are only road maintenance, this issue will not be addressed.
26.	Will the subproject lead to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles?	x		Depending on the type of vehicles used during maintenance.
G. Cultural Property				
27.	Will the subproject have an impact on archaeological or historical sites, including historic urban areas?		x	Since the activities are only road maintenance, this issue will not be addressed.
28.	Will the subproject have an impact on religious monuments, structures and/or cemeteries?		x	Since the activities are only road maintenance, this issue will not be addressed.
29.	Have Chance Finds procedures been prepared for use in the subproject?		x	Based on the site visit, there will be no actual encounter of archeology or heritage. However, in case, during maintenance, antiquities were identified in the project site chance find procedures should be followed
H. Expropriation and Social Disturbance				
30.	Will the subproject involve land expropriation or demolition of existing structures?		x	No land expropriation and demolition is required.
31.	Will the subproject lead to induced settlements by workers and others causing social and economic disruption?		x	The level of proposed activities should not include such impact.
32.	Will the subproject lead to environmental and social disturbance by construction camps?		x	No construction camps are going to be constructed.
33.	Will the sub-project lead to physical displacement (title-holders, squatters, and vulnerable groups)?		x	Since the activities are only road maintenance, this issue will not be addressed.
34.	Will there be economic displacement?		x	Since the activities are only road maintenance, this issue will not be addressed.
35.	Will there be loss of assets/infrastructure?			This issue will be difficult to assess as it depends on the required depth of excavations and the undeclared local infrastructure

S No	ISSUES	YES	NO	Comments
36.	Will the sub-project impact livelihood of non-titled persons and vulnerable groups?		x	Since the activities are only road maintenance, this issue should not be addressed.

Table C3 Site Characteristics

S. No	ISSUES	YES	NO	Comments
1.	Is the subproject located in an area with designated natural reserves?		x	
2.	Is the subproject located in an area with unique natural features?	x		
3.	Is the subproject located in an area with endangered or conservation-worthy ecosystems, fauna or flora?		x	
4.	Is the subproject located in an area falling within 500 meters of national forests, protected areas, wilderness areas, wetlands, biodiversity, critical habitats, or sites of historical or cultural importance?		x	-
5.	Is the subproject located in an area which would create a barrier for the movement of conservation-worthy wildlife or livestock?		x	The subproject will not affect wildlife or livestock, keeping in mind that it is also temporary.
6.	Is the subproject located close to groundwater sources, surface water bodies, water courses or wetlands?		x	-
7.	Is the subproject located in an area with designated cultural properties such as archaeological, historical and/or religious sites?	x		The subproject will not affect the designated cultural properties, keeping in mind that it is also temporary and only maintenance will be performed.
8.	Is the subproject in an area with religious monuments, structures and/or cemeteries?	x		The subproject will not affect the religious monuments, keeping in mind that it is also temporary and only maintenance will be performed.
9.	Is the subproject in a polluted or contaminated area?		x	-
10.	Is the subproject located in an area of high visual and landscape quality?	x		The maintenance of roads will not affect the visual and landscape quality.
11.	Is the subproject located in an area susceptible to landslides or erosion?		x	-
12.	Is the subproject located in an area of seismic faults?		x	-
13.	Is the subproject located in a densely populated area?		x	-
14.	Is the subproject located on prime agricultural land?	x		It consists mainly on fruits. However, agriculture will not be influenced.
15.	Is the subproject located in an area of tourist importance?	x		The maintenance activities are minimal and temporary so no issues will be arised.

S. No	ISSUES	YES	NO	Comments
16.	Is the subproject located near a waste dump?		x	-
17.	Does the subproject have access to potable water?	x		-
18.	Is the subproject located far (1-2 kms) from accessible roads?		x	The subproject involves the maintenance of the roads.
19.	Is the subproject located in an area with a wastewater network?		x	-
20.	Is the subproject located in the urban plan of the city?	x		-
21.	Is the subproject located outside the land use plan?		x	-

CONCLUSION

	High	Substantial	Moderate	Low
RISK CLASSIFICATION OF THE SUBPROJECT			x	

ANNEX D: CODE OF CONDUCT

Contractor Code of Conduct Form

مدونة سلوك - Code of Conduct

مشروع الطرق والعمالة - Roads & Employment Project

الممول من قبل البنك الدولي (القرض رقم ٨٧٠٥ - لبنان)، بإدارة وتنفيذ مجلس الإنماء والإعمار لصالح وزارة الأشغال العامة والنقل

تعتبر مدونة السلوك هذه وثيقة ضرورية لحماية جميع العاملين في مشروع الطرق والعمالة من جميع مظاهر العنف القائم على أسس اجتماعية، التمر، سوء المعاملة، التحرش والاعتداء والاستغلال الجنسي وأي سلوك اجتماعي آخر يخلّ بحقوق الإنسان، المجتمع المحلي والآداب العامة، بما في ذلك المعايير التالية:

<ul style="list-style-type: none"> • الالتزام بمعاملة النساء والرجال والشباب باحترام بغض النظر عن انتمائهم الديني، العرقي، الطائفي، اللغوي، التوجه السياسي، الإعاقة، الجنسية، الجندرة، الخ. • احترام موقع العمل وأدوات العمل المشتركة: نظافة المكان، عدم التعدي على الممتلكات العامة المجاورة للأعمال، الخ. 	<p>١- التزام الاحترام والآداب العامة</p>
<ul style="list-style-type: none"> • العنف القائم على النوع الاجتماعي: أي فعل مؤذٍ يرتكب ضدّ إرادة الشخص. وهو مبنيٌّ على الفروق بين الذكور والإناث التي يُعزى وجودها لأسباب اجتماعية. • العنف الجنسي: الاغتصاب، الاعتداء الجنسي، التحرش الجنسي، الخ. • العنف الجسدي: الضرب، الصفع، الضرب المتكرر أو باستعمال أداة، الخ. • العنف العاطفي: الاستغلال النفسي، والابتزاز، الخ. • العنف الاقتصادي: الحرمان من الموارد، الحصول على أدوات العمل، عدم الالتزام بالأجر المتفق عليه، الخ. 	<p>٢- عدم استعمال العنف بشتى أشكاله</p>
<ul style="list-style-type: none"> • الالتزام بالتصدي لأي شكل من أشكال التحرش أو التمييز أو التخويف أو الاستغلال أو الاعتداء الجنسي بما في ذلك التعليقات المهينة المتعلقة بالميل الجنسي، القبح بألقاب أو عبارات ذات دلالات جنسية، التحديق بطريقة ذات إيحاء جنسي، اللمس غير مرغوب فيه، القيام بحركات جنسية غير لائقة، تبادل الحكايات أو النكات الجنسية، توجيه رسائل ذات إيحاء جنسي بأي شكل من الأشكال، محاولة الاعتداء الجنسي أو ارتكابه، بما في ذلك الاغتصاب. 	<p>٣- التحرش والاعتداء والاستغلال الجنسي</p>

أنا الموقع أدناه، أقر بأنّي قرأتُ وتبيّنتُ وفهمتُ وتلقّيتُ الشرح والتدريب والمعلومات الكافية عن مدونة السلوك التابعة لمشروع الطرق والعمالة. وأوافق على الامتثال للمعايير الواردة فيها وأعرف أن أي إجراء يتعارض مع مدونة السلوك هذه قد يؤدي إلى اتخاذ إجراء تأديبي وقد يؤثر على استمرارية عملي ضمن مشروع الطرق والعمالة.

أسم وامضاء المشرف على الاعمال (من قبل الاستشاري)	أسم وامضاء مسؤول الموقع (من قبل المتعهد)	أسم وامضاء العامل
التاريخ:	التاريخ:	التاريخ:

العامل يجيد القراءة، وقد دون اسمه وامضاءه

العامل لا يجيد القراءة، وقد تُلّيت عليه مدونة السلوك وتم الامضاء نيابةً عنه من قبل الأخصائي الاجتماعي

ANNEX E: PLANS AND PROCEDURES DURING MAINTENANCE ACTIVITIES

Pollution Prevention Plan

The Contractor shall prepare and abide by a Pollution Prevention Plan to ensure that pollution to air, water or land is prevented or, where this is not possible, reduced and mitigated as far as practicable during the construction phase. The Pollution Prevention Plan will be developed for managing:

- liquid effluents
- air emissions
- noise and vibration
- fuel, oil, and chemical storage and handling
- hazardous, non-hazardous, and household waste handling, storage and final disposal
- vehicle and equipment selection and maintenance

Effluent Management Provisions

- No effluent shall be discharged under any condition neither into water courses or bodies including surface water bodies nor to ground surface or infiltrated into subsoils
- Install mobile porta-cabins and connect the generated wastewater from workers to the existing sewage network or to polyethylene tank
- Empty the tank in the sewer network or into nearby operational wastewater treatment plants either by municipality-owned or contracted wastewater tankers

Rainwater run-off Management Provisions

- Install temporary structures to prevent runoff from reaching nearby water bodies
- Remove base coarse and sand from active maintenance sites to prevent the transfer of suspended solids in rainwater
- All platforms where generators or hydrocarbon storage tanks are installed have an impervious layer
- Restrict excavation activities during periods of intense rainfall

Atmospheric Emissions and Dust Management Provisions

- Exercise care to minimize emissions of dust from its activities, including traffic, at work sites, in residential areas and on access roads.
- Stop dust generating activities during windy weather especially in residential areas
- Where it is deemed that dust is impacting or may have an impact on human, plant or animal receptors or where dust may cause sedimentation of watercourses/water bodies or unacceptable levels of soil loss, water shall be applied to the area creating the dust

- ❑ Control vehicle speeds to reduce traffic-induced dust dispersion and resuspension by setting and enforcing speed limits
- ❑ Post speed limit signs in sensitive areas
- ❑ Ensuring trucks hauling sand, dirt or other loose materials are covered (sheeting trucks)
- ❑ Cover dusty stockpiles
- ❑ Suspending topsoil stripping and replacement during strong winds
- ❑ Using a dust collection system for bulk materials unloading
- ❑ Ensure proper handling and storage of materials thus minimising the areas of stockpiled materials
- ❑ When storage, transport and handling of bulk materials is made in the open air and exposed to the wind, necessary dust abatement measures shall be implemented
- ❑ Regular maintenance of construction machinery, equipment and vehicles

Spill Prevention and Management

- ❑ Spill clean-up procedure to reduce the risks of accidental leakages
- ❑ Carry out all re-fuelling in designated areas with impervious surfaces and guarantee no fuel spills
- ❑ A spill collection tank must be installed under generators and specific equipment
- ❑ All chemicals shall be stored in dedicated areas on a paved or sealed floor and in tightly closed containers and be protected from adverse weather conditions
- ❑ Used oil or chemical must be stored in an appropriate area until it is collected and disposed in licensed sites
- ❑ Use of secondary containment basins for long term storage of lubricants and fuels
- ❑ Ensure that the plan is present at the construction site and that oil spill response kits are available
- ❑ Ensure proper housekeeping conditions are maintained at the oil/chemical storage areas
- ❑ Train all workers to implement this plan in case of accidental spillage

Waste Management Plan

This plan shall be developed and implemented by the Contractor to manage the generated waste effectively. The plan shall include the following components:

- ❑ Establish and maintain a waste register which is at the disposal of the Engineer. This register will record all waste management operations: production, collection, transport and disposal. Waste shall be categorized according to the following definitions:
 - Non-hazardous solid waste generated at maintenance sites and offices includes excess fill materials from grading and excavation activities, scrap wood and metals, and small concrete spills. Other non-hazardous solid wastes include office and kitchen wastes.

- Hazardous solid waste includes contaminated soils, oily rags, used oil filters, used oil, as well as spill cleanup materials from oil and fuel spills
- Waste shall be collected from each maintenance sites and from offices at the same rate that it is produced
- All the waste materials generated at work sites and offices shall be segregated into domestic (organic/ paper and cardboard/ metals, glass and plastics) and hazardous waste and disposed into the color-coded containers (one for the disposal of organic waste, one for paper and cardboard and one for aluminium, glass and plastics)
- The domestic waste containers shall be emptied 2 to 3 times per week by the municipality to maintain maintenance sites sanitation
- Segregated recyclables shall be sent to recycling facilities in the area where possible
- Reuse of excavation materials generated during cutting and filling activities whenever possible and disposal of remaining material in controlled disposal site to be identified by the contractor in coordination with the relevant municipality
- Approval letters shall be obtained from the concerned municipalities for domestic and construction waste disposal
- Reuse or recycle the generated waste whenever possible
- Train workers on waste reduction procedures
- Provide workers with nearby sanitation facilities and inform them about their location
- The work zone shall be cleaned on a daily basis. Construction leftovers that are external to the working zone shall be removed regularly. Site housekeeping must be maintained

Hazardous Materials Management Plan

A Hazardous Materials Management Plan will be developed for hazardous materials that pose a potential risk to human health or the environment and include cleaning chemicals, solvents and fuels. The plan shall include the following:

- Fuel and hazardous chemicals/materials shall be stored in designated areas, except for quantities generated or required for the daily construction activities.
- All fuel and hazardous chemical storage facilities shall be located on flat or gently sloping ground and shall be contained within a bund designed to contain at least 110% of the total capacity of the storage containers plus 10% of the aggregate tank volume within the containment area or as otherwise specified by regulatory requirements. The bund walls and floor shall be constructed of concrete or other suitably impermeable material. The filling connection must be within the bund. No drain valves or other connections through the bund walls shall be permitted. Tanks shall be fitted with a gauge to allow the fill level to be monitored during refilling and preferably with a high-level alarm.
- Hydrocarbons, lubricants, paints, solvents and batteries are transported in drums to suitable waste management facilities, if available

Emergency Preparedness and Response Plan

An Emergency Preparedness and Response Plan (EPRP) will be developed so that the Contractor is prepared to respond to accidental and emergency situations in a manner that prevents and mitigates harm to people and the environment. The EPRP needs to be discussed and disclosed to service providers and local affected communities prior to construction. The EPRP shall cover the following emergency situations as a minimum/;

- Medical emergency
- Fire or explosion;
- Hazardous Material Spill or Release;

The EPRP will identify

- Accidents and emergency situations and the communities and individuals that may potentially be impacted
- Response procedures, provision of equipment and resources, designation of responsibilities, communication systems and channels and periodic response training

The Project will need to ensure that the Contractor shall

- Maintain fit-for-purpose Emergency Response Capability, which shall be clearly documented
- Make contingency arrangements for calling a Doctor and transporting injured persons to hospital. The telephone numbers of the emergency services and the name, address and telephone number of the Doctor and the nearest hospital shall be prominently displayed in the Contractor's office.
- Ensure that all personnel are informed and aware of how to react in an emergency situation, and responsibilities are defined. Information and awareness training shall be documented, and available on all Project Areas
- Organize and document emergency simulation exercises within 3 months of the physical start of the works, and subsequently once every 12 months

Traffic Management Plan

A Traffic Management Plan (TMP) will need to be developed by the main contractor. The TMP shall be a starting point for further discussion between the main contractor, local authorities and road agencies. The plan will include preventative measures to manage the risks from potential increases in traffic from construction activities including transportation of material and workers to and from the maintenance activity sites. In addition, it will include measures to protect workers and manage the risks from civilian traffic within close proximity to maintenance activities especially within residential areas. The TMP will be refined and updated as access routes are confirmed and the timing and type of abnormal loads become known.

The TMP shall include the following:

- ❑ Proposed program of works;
- ❑ Details of key stakeholders;
- ❑ Details regarding the proposed method of construction;
- ❑ Proposed Temporary Traffic Control/ Management Plans (TTCP/ TMP);
- ❑ Various traffic diversion plan layouts for various type of activities;
- ❑ Diversion signs;
- ❑ Regulatory signs;
- ❑ Informative signs;
- ❑ Analysis of impacted roads;
- ❑ Risk Assessment;
- ❑ Proposed working hours; and
- ❑ Protection of Work Zones and road users including pedestrians;

The TMP shall be approved by the Consultant prior the execution of work.

A special TMP shall be prepared regarding works on Highways.

Noting that Works on Highways shall be minimized during Peak- Hours and maximized during off-peak hours, 7 days a week.

Public Health and Safety Plan

An effective Public Health and Safety Plan for construction shall include at least the following components:

- ❑ Secure the site and restrict access to it
- ❑ Prohibit unattended/unauthorized public access
- ❑ No children are allowed to be present on the work site, reminding workers and community members of this in all related communications
- ❑ Install barriers with warning lights at night around excavations, material dumps or other obstructions at the maintenance sites
- ❑ Install warning signs for drilling and maintenance at the external part of the site and at a distance of 100 meters
- ❑ Inform residents and place proper safety and diversion signs at sensitive areas within the project area (i.e. near schools, shops hospitals and agriculture areas)
- ❑ Install pedestrian and vehicular passages near residential areas
- ❑ Accidental oil spillage shall be well controlled
- ❑ Make sure at least three sets of first aid kits are present on the construction site.
- ❑ Access to hospitals should not be impeded at any time
- ❑ Properly manage trucks and heavy machinery entering and exiting the construction site.
- ❑ Training of heavy machinery drivers about road safety

- ❑ Equip Project drivers with telephones for contacting the emergency services to enact the EPRP if necessary in case of emergency.
- ❑ Keep stakeholders informed of maintenance schedule and abide by assigned timing
- ❑ Manage the grievance mechanism through which community members can make complaints about project activities
- ❑ The community health and safety plan shall cross reference with other relevant management plans such as the TMP and EPRP. Local health care and emergency services shall be consulted in the development of the plan.

Occupational Health and Safety (OHS) Plan

In addition, the Contractor shall ensure the workers' health and safety against possible accidents and injuries from the various maintenance activities. The plan shall include the following:

- ❑ Hazard Identification and assessment including (Physical injuries from: Traffic accidents, Falling from moving vehicles, Loss of stability and overturning of equipment, Falling from height, Hit by construction materials, Slips, trips and falls, Electrical incidents, Burns from hot works, Health problems due to: Fumes and dust, Noise and vibration, Excessive manual handling, Disease outbreaks, Asphyxiation in confined spaces and Fire)
- ❑ OHS protection measures for the identified hazards
- ❑ OHS protection measures for Unexploded Explosive Ordnance
- ❑ Prevention and precaution measures for COVID-19
- ❑ Identify the mandatory personal protective equipment (PPE) to be used including hard hats, safety boots, reflective vest as well as specific PPEs
- ❑ Identify and manage dangerous substances planned to be used on the project area
- ❑ Work Permit System for Confined Space Entry, Hot Works, Excavation, Lifting, Working at Height, Handling of Hazardous Materials, and Electrical works
- ❑ Safe Work Method Statements
- ❑ Hazard communication
- ❑ Emergency and Evacuation procedures
- ❑ Accident and incident reporting and investigation

The Contractor shall implement mitigation measures as per the Occupational Health and Safety Plan. Measures include but not limited to:

- ❑ Personnel and visitors to maintenance activity areas shall be equipped with a safety helmet, safety shoes and a reflective jacket as a minimum.
- ❑ Adequate quantities of PPE shall be available on the project areas and stored properly
- ❑ Personnel shall be trained on how to use and care for PPE

- ❑ Conduct training and awareness meetings including correct use of PPE, health and safety procedures, and handling hazardous material containers and related wastes
- ❑ Ensure refreshing training session on occupational health and safety measures is conducted on a monthly basis
- ❑ Ensure that supervision, directly in charge of construction activities, fully brief and discuss with Personnel HS Tool Box Talks at the start of each work day and prior to commencing new activities. These talks shall be conducted in a language understood by the workforce. A checklist shall be utilised for this purpose. At a minimum it shall include the following: Nature of the job, associated hazards, safe working methods to be adopted and requirements of the Permit to Work
- ❑ Ensure a minimum of first-aid provisions on any work site, including: suitably stocked first-aid kits; a person, respectively an adequate number of staff appointed and trained to take charge of first-aid arrangements and ensure that staff and workers are informed about first-aid arrangements
- ❑ Equip the project area with a communication system exclusively for the purposes of communication with the first aid services. Information on how to communicate with the first aid services shall be clearly indicated near the communications equipment
- ❑ Collaborate with local health authorities and make arrangement with an appropriate number of local doctors, and/or nurses, hospitals and ambulance services to ensure that medical staff, first aid facilities, and ambulance service are available within the project area
- ❑ Measures as per national guidelines published by WHO and Ministry of Public Health regarding COVID-19 prevention and quarantine procedures
- ❑ Workplace inspections

Chance Finds Procedure

The chance find procedure is a project-specific procedure that identify actions necessary if previously unknown heritage resources, particularly archaeological resources, are unexpectedly encountered during project construction phase. A Chance Find Procedure will set out how chance finds associated with the project will be managed and will include the following requirements:

- ❑ Notify relevant authorities (Directorate of General of Antiquities) of found objects or sites
- ❑ Fence the area of finds or sites to avoid further disturbance
- ❑ Conduct an assessment of found objects or sites by cultural heritage experts in order to identify and implement actions consistent with the requirements of ESS8 and national legislation
- ❑ Train project personnel and project workers on chance find procedures

ANNEX F: PUBLIC PARTICIPATION

List of attendees

<i>Organization</i>	<i>Person</i>	<i>Position</i>	<i>Comments</i>	<i>Phone</i>
Municipality of Diddeh	Rabih Al Ayoubi	Head of Municipality	Attended the public participation session	+961 3 204768
-	Robert Issa	Contractor	Attended the public participation session	+961 71 541166
Municipality	Najat Najib Al Zoghby	Head of Municipality	Attended the public participation session	+961 3 428885
Municipality of Kfarshaya	Michel Nasr	Head of Municipality	Attended the public participation session	+961 3 601337
Union Municipalities of Koura	Firyal Taleb	Secretary of Union Municipalities of Koura	Attended the public participation session	+961 3 553595
Municipality of Darhinar	Ishak Abboud	Head of Municipality	Attended the public participation session	+961 3 641170
Municipality of Kfarhaloun	Michel El Helou	Head of Municipality	Attended the public participation session	+961 3 653600
Municipality of Shamzany	Wassim Al Najjar	Municipality Member	Attended the public participation session	+961 3 360181
Municipality	Ghassan Haidar	Head of Municipality	Attended the public participation session	+961 3 333948
Municipality	Talal Mansour	Head of Municipality	Attended the public participation session	+961 3 340250
Municipality of Titram	Henry Dib	Municipality Member	Attended the public participation session	+961 3 25044
Municipality of Mitrit	Roland Andary	Head of Municipality	Attended the public participation session	+961 3 590920
Municipality of Kfaraaka	Elias Sassine	Head of Municipality	Attended the public participation session	+961 3 803444
Municipality	Amin Ibrahim	Municipality Member	Attended the public participation session	+961 3 813084
Municipality of Kfarmzir	Fawzy Al Maalouf	Head of Municipality	Attended the public participation session	+961 3 180045
Municipality of Amyoun	Malik Faris	Head of Municipality	Attended the public participation session	+961 70 990070
Municipality of Anfeh	Wafaa Nkoula	Municipality Member	Attended the public participation session	+961 3 304157

NGO Attendees

<i>Name</i>	<i>First join</i>	<i>Last Leave</i>	<i>In-meeting</i>	<i>Role</i>
khalil zein	2/23/22, 11:01:56 AM	2/23/22, 11:41:05 AM	39m 8s	Role
Ghia Haddad (El)	2/23/22, 11:02:06 AM	2/23/22, 11:40:59 AM	38m 53s	Organizer
Palig Demirdjian (mouawad Foudation) (Guest)	2/23/22, 11:02:10 AM	2/23/22, 11:40:48 AM	38m 37s	Presenter
Rym Dada (Rotary) (Guest)	2/23/22, 11:02:11 AM	2/23/22, 11:38:10 AM	35m 59s	Presenter
Ziad Farah	2/23/22, 11:02:15 AM	2/23/22, 11:41:22 AM	39m 7s	Presenter
Marie-Jeanne (Kousba Al Ghad	2/23/22, 11:02:16 AM	2/23/22, 11:40:50 AM	38m 33s	Presenter

and Municipality of Kousba)				
TCH	2/23/22, 11:05:41 AM	2/23/22, 11:40:57 AM	35m 16s	Presenter
Rym Dada (Rotary) (Guest)	2/23/22, 11:37:40 AM	2/23/22, 11:40:48 AM	3m 7s	Presenter

PowerPoint Presentation

2/15/2022



خطة الإدارة البيئية والاجتماعية لمشروع الطرق والعمالة

الإجتماع التشاوري لتهيئة الطرق في قضاء الكورة




المقدمة

- بصفتها تدرج الاستراتيجية الوطنية للتحول الاقتصادي الرقمي 2018 قبل الجبهة الوطنية في لبنان هي ذات صلة رئيسية للتطوير الاقتصادي.
- ومن بين المبادرات الموجهة للتحول الرقمي التي يمتددها المنتدى الاقتصادي الرقمي، جعل لبنان الرتبة الأولى 121 منظمة لوجستية الطرق (المنتدى الاقتصادي الرقمي، 2018).
- وعلى لبنان من حوادث الجبر بحيث مملاتها هي الأعلى عالمياً مقارنة بمدى السكان.

أهداف المشروع

يهدف هذا المشروع إلى سحقة الطرق بحيث تتفرع وتختلف الأنشطة بين طريق وآخر، اعتماداً على تصنيف الطريق، من حيث حالة الرصف والتكثيف وسدادي الصرف والأجود الأرضي المحقق وأو تلك القدرة والجران الاسفلتية وممرات المشاة واسعة وأو إعادة تأهيل أجزاء الشوارع.

سنتج تنفيذ أنشطة الصيانة الريفية لمدة عشرين، للطرق الرئيسية كالأريه والطرق الثانوية حيث توفر الأموال.



أهداف مشروع الطرق والعمالة

المكون الثالث	المكون الثاني	المكون الأول
بناء قدرات ودعم التنفيذ	تحسين القدرة على الإستجابة لتطورات	إعادة تأهيل الطرق وصيانتها
<ul style="list-style-type: none"> • بناء قدرات الهيئات اللبنانية في التخطيط وإدارة قطاع الطرق • المساهمة في تدريب وبناء قدرات الممارسين والمهنيين على المشاريع حول تقنيات حديثة مصممة لبناء الطرق وصيانتها 	<ul style="list-style-type: none"> • تحسين قدرات وزارة الأشغال العامة واقتل على التعامل مع الطوارئ المتعلقة بالطرق (الحوادث...) • مراجعة إجراءات الطوارئ الحالية التي لديها وزارة الأشغال العامة واقتل وهدرها على التخطيط والاستعداد للحالات الطارئة 	<ul style="list-style-type: none"> • إعادة تأهيل حوالي 500 كم من الطرق الرئيسية والثانوية والريفية • تحسين أداء خطوط النقل وخلق وظائف مباشرة وغير مباشرة للبيانيين والسوريين

2/15/2022

أهداف خطة الإدارة البيئية والاجتماعية

الأهداف بعيدة الأمد

الأهداف قصيرة الأمد

- ضمان التوافق مع المعايير البيئية
- تحديد الآثار والإجراءات التخفيفية
- تحسين الأوجه الاجتماعية للمشروع
- تعاقب المنع الذي لا يمكن إنزاله أثره على البيئة
- حماية الصحة البشرية والسلامة العامة
- حماية الموارد البيئية
- تحقيق الشفافية عبر إبلاغ العامة على المشروع
- ونشر مكرهه
- تحقيق مبدأ الإستدامة

أهداف الخطة الإدارة البيئية والاجتماعية

أطر السياسات والأطر القانونية والإدارية

- القانون رقم ٢٠٠٧/٤٤٤ قانون حماية البيئة
- مرسوم رقم ٢٠١٢/٨٦٣٣/٨٦٣٣ مرسوم تنظيم الآثار البيئية الذي حدد المشاريع التي تسطرح حكماً إعداد دراسة تقييم أثر بيئي.
- قرار 52/1 (1996)
- قرار 8/1 (2001)
- السياسات التقنية للبنك الدولي (OP4.01, OP4.12)

فهرس خطة الإدارة البيئية والاجتماعية

1. ملخص تنفيذي
2. مقدمة
3. أطر السياسات والأطر القانونية والإدارية
4. وصف مكونات المشروع
5. وصف البيئة المحيطة
6. مشاركة العامة
7. تقييم الآثار البيئية المحتملة
8. خطة الإدارة البيئية

وصف البيئة المحيطة

- نوعية التربة والبيئة السطحية والهوائية
- تقييم الوضع الجغرافي والهيدرولوجي
- تقييم الوضع البيولوجي
- وضع المشروع
- الوضع الاجتماعي والاقتصادي للمنطقة
- مدى توفر البنية التحتية

الأشغال المقترحة

- إصلاح ورصف الطرق قسط وزيد طيات تسميح للحدسفات
- إصلاح المدرجات الانحدافية الدرسية للقلع / جدران للسرية
- إصلاح الأرصفة وجدران الأمان
- إصلاح شبكة تصريف مياه الأسفل
- إصلاح شبكات الإنارة وكافة الأسفل كهربائية وللدينية المنطقة بها
- تعديل شبكات الطرق
- الأسفل لمساعدة الأخرى المرتبطة بنا في تلك إداره حركة المرور أثناء السبالة
- مدة المشروع هي سنتين

2/15/2022

الآثار البيئية المحتملة

- التآكل على نوعية الهواء ونوعية المياه
- زيادة في سعة المخططات السلبية الناتجة عن عملية العمل
- زيادة في مستوى السجج
- تآكل الحركة الجذرية للركبسات والحلقات العائمة على جانبي الطريق
- تآكل في حركة السير
- خطر على الصحة والسلامة المهنية والعامة (في حال وصول أي حلات)

التدابير التخفيفية

المخلفات الصلبة	نوعية المياه	نوعية الهواء
تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	تجنب تسرب مياه الصرف الصحي إلى المياه الجوفية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	إستخدام آلات ذات استهلاك منخفضة في أعمال البناء، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة
تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	تجنب تسرب مياه الصرف الصحي إلى المياه الجوفية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	إستخدام آلات ذات استهلاك منخفضة في أعمال البناء، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة
تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	تجنب تسرب مياه الصرف الصحي إلى المياه الجوفية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	إستخدام آلات ذات استهلاك منخفضة في أعمال البناء، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة

التدابير التخفيفية

الضوضاء	الصحة والسلامة المهنية	حركة المرور
تجنب استخدام الآلات ذات استهلاك عالية في أعمال البناء، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة	تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه
تجنب استخدام الآلات ذات استهلاك عالية في أعمال البناء، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة	تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه
تجنب استخدام الآلات ذات استهلاك عالية في أعمال البناء، تجنب استخدام الآلات الميكانيكية الثقيلة، تجنب استخدام الآلات الميكانيكية الثقيلة	تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه	تجنب تخزين ومطبخ على مدار اليوم، اختيار مستلزمات العمل ذات الجودة العالية، تجنب التخلص من مخلفات البناء في مجرى المياه، تجنب التخلص من مخلفات البناء في مجرى المياه

خطة الإدارة البيئية والاجتماعية

هدف الخطة الإدارية البيئية والاجتماعية من مراقبة المشروع والتأكد من مطابقتها مع جميع المعايير البيئية. بعد دراسة الآثار المحتملة للمشروع، تقوم الدراسة بإقتراح استراتيجيات تخفيفية لهذه الآثار وسبل لمراقبتها.

خطة الإدارة البيئية تتضمن:

- مراقبة نوعية المياه
- مراقبة نوعية التربة
- مراقبة نوعية الهواء
- مراقبة نوعية التلوث البيولوجي
- مراقبة الصحة والسلامة العامة
- خطة طوارئ للتصرف السليم في حال حدوث أي حادث مفاجئ

شكراً لحضوركم



ANNEX F: COMPLAINTS REGISTER FORM

Name, phone and address of Complainant	Date of the complaint	Complaint issue and action taken	Corrective Action	Name of employer/ representative notified of complaint	Type of Complaint	Date of close out