REPUBLIC OF LEBANON

COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION

Consultancy Services For
Roads Routine Maintenance
For Lot 15 (Kesrouane Caza)

CDR Contract No. 20832

Final Tender Documents
For
Roads Routine Maintenance

Environmental and Social Management Plan
(ESMP)

October 2023

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Abbreviations and Acronyms

CAE	Child Abuse and Exploitation
CDR	Council for Development and Reconstruction
CoC	Code of Conduct
CoM	Council of Ministers
DGA	Directorate General of Antiquities
EHS	Environment Health and Safety
ESHS	Environmental, Social, Health and Safety
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FHH	Female Headed Households
GER	Gross Enrolment Ratio
GBV	Gender Based Violence
GOL	Government of Lebanon
GRM	Grievance Redress Mechanism
H&S	Health and Safety
IFC	International Finance Cooperation
ILO	International Labour Organization
LULC	Land Use Land Cover
MoA	Ministry of Agriculture
MoC	Ministry of Culture
MoE	Ministry of Environment
MoWE	Ministry of Water and Energy
MoIM	Ministry of Interior and Municipalities
MoL	Ministry of Labor
MoPH	Ministry of Public Health
MoPWT	Ministry of Public Works and Transportation
MoSA	Ministry of Social Affairs
NER	Net Enrolment Rate
NGOs	Non-Governmental Organizations
OP	Operational Plan
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Administration
PAPs	Project Affected Persons
PHS	Public Health and Safety
PIU	Project Implementation Unit
PM	Particulate Matter
KPI	Key Performance Indicator
REP	Roads and Employment Project
RPF	Resettlement Policy Framework
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
WB	World Bank
WBG	World Bank Group

EXECUTIVE SUMMARY

Introduction

The Lebanon Roads and Employment Project (REP) is a World Bank (WB) funded project that aims through its first component to improve transport connectivity along select paved road sections and create short-term jobs for the Lebanese and Syrians. The project is implemented by the Council for Development and Reconstruction (CDR) in coordination with the Ministry of Public Works and Transport (MoPWT), noting that all the roads under the REP are under the jurisdiction of the MoPWT.

More specifically, the first component of the REP "Roads Rehabilitation and Maintenance "consists of rehabilitating and maintaining of about 500 km of primary roads (including International roads/ Highways) throughout Lebanon.

Considering that the anticipated civil works will result in environmental and social impacts, an Environmental and Social Management Plan (ESMP) shall be prepared under the requirements of OP4.01, which classifies the project as Category B to reduce the footprint of REP's operations in Kesrouane. Accordingly, Dar Al Handasah Nazih Taleb & Partners, which was assigned by CDR to prepare all the tender documents needed for the rehabilitation and maintenance works of the roads located within Kesrouane Caza, developed in year 2020 an ESMP covering roads that were selected by the Lebanese Government for full rehabilitation works. The ESMP was consulted upon, cleared by the WB and disclosed on the CDR and the WB websites.

In this report, an ESMP has been formulated for Kesrouane Caza, focusing on routine maintenance tasks for primary roads and highways, which includes the repair of expansion joints on the highways. Routine maintenance activities, while broadly distributed, are generally of a smaller scale when compared to rehabilitation efforts. Consequently, these activities do not warrant a modification of the environmental and social safeguard classifications set forth in the existing REP. To effectively address the environmental and social challenges linked to this new inclusion, pertinent mitigation measures, as well as requisite institutional frameworks, have been encompassed within this ESMP Report.

Noting that the Project was signed before October 2018, date of effectiveness of the World Bank (WB) Environmental and Social Framework (ESF).

Project Description

The project consists of routine maintenance activities in Lot 15- Kesrouane Caza namely for primary roads (including International roads/ Highways). The goal of this six-month project is road improvement. It is projected to engage 20 workers on regular workdays, with the potential to expand the workforce to as many as 30 individuals during peak maintenance periods, such as the period preceding the rainy season.

Routine maintenance activities include incidental repair works, pavement repair works, concrete repair works, installation of traffic control and safety devices and repair the damaged expansion joints of highway bridge BR-1 (i.e. Adma interchange). Accordingly, the assessment was conducted at the Caza level focusing on BR-1 and five representative roads throughout

Kesrouane Caza: **Road K1** -Naher el Kaleb- Ajaltoun- Faraya – Oyoun El Siman (48 km); **Road K2** - Ain Ed Delbe – Nahr Ed Dahb- Jouret el Tourmous – El Ghine (11 km); **Road K3** - Aajaltoun – Daraya – Hemlaya (4km); **Road K5** - Jounieh – Casino – Nahr Ibrahim (10 km) and **Road K6** Jounieh –Bkerke – Harissa – Aachqout – Wata El Jaouz (22 km).

Existing Policies, Legal and Administrative Framework

This ESMP was conducted in accordance with the WB environmental and social standards and the Lebanese laws and regulations namely Law No. 444 (2002) for Environmental Protection. More specifically, routine maintenance activities will be done under OP 4.01 Environmental Assessment.

World Bank Policies and Procedures: Compliance with OP/BP 4.01 on Environmental Assessment and OP/BP 4.12 on Involuntary Resettlement. According to OP/BP 4.01, a public consultation with project-affected people and local non-governmental organizations (NGOs) must be conducted for all projects under Category A and Category B.

The WB Group (WBG) Environmental, Health and Safety (EHS) Guidelines are mandatory and need to be adopted throughout the project duration.
The assessment recorded the existing physical, biological and socioeconomic conditions within the area of influence prior the project implementation. This data was then analyzed for impact prediction and assessment.

The geology at the Caza level 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 Kesrouane roads mostly fall on a karstic limestone formation. The system is characterized by a significant amount of groundwater flowing in channels, faults and fractures. The transmissivity of these formations is generally high and water table is shallow. In other words, nearly all roads in Kesrouane lie on permeable formations which expose the groundwater aquifers to possible contamination (e.g. K3 falls 100% over J6 and all other roads K1, K2, K5, and K6 are more than 70% sitting on Jurassic and cretaceous formations).

More specifically, the outcropping lithological formations in and around the study area belong to multiple geological time periods namely, to the Cretaceous (46%) and Jurassic (31%) geological time periods. Some roads are very rich in winter drainage channels that discharge downstream to “Wadi Tabarja” and “Wadi Ghazir, others intersect with Nahr Ibrahim (e.g. Road K1 intersects with the Nahr Ibrahim river several times in Faraya, Mazraat Kfardebian, and Mchee Kesrouane (Kfardebian), Nahr el Kaleb and Wadi Jounieh. Finally, some roads are surrounded by several surface winter drainage channels which lead downstream to “El Kaleb” river.

Regarding natural habitats and biodiversity, roads under study involve a path that is already under anthropogenic influences. The overall ecosystem is impacted with a resulted monotonous vegetation cover (involving resilient species). More specifically, the majorities of roads are bordered by human settlements, commercial shops, agricultural lands, cultivated trees, and degraded ecosystems with low vegetation cover namely scrublands, open garrigue vegetation characterized by dwarf shrub. These types of habitats do not provide a favorable environment for

a large variety of plants and animals. However, some roads partly involve particular biotopes that need special care. Roads bordered by riparian habitats, dense oak forests, and pine forests hold vital ecological importance, serving as refuges for various plant and animal species. Pine forests, in particular, contribute to biodiversity and ecosystem balance, aiding in carbon sequestration and water filtration. Furthermore, mountainous road segments with rocky habitats provide critical breeding sites for avian predators and shelter for reptiles, hosting essential floral communities. Special care is needed during routine maintenance activities on mountainous primary roads (e.g. Road K1, particularly in Kfardbiane and Oyoun el Simane), to protect endemic and rare species and safeguard the springs and ecosystems in this area.

Lastly, a socio-economic survey was conducted in the project area focusing on immediate sensitive receptors. Nearly all assessed roads include segments that are in close proximity to residential buildings, shops, and churches (e.g. Saydet Najet Church is 16 m away from Road K2, Christ Bible Baptist church is 4 m away from Rod K1 and Saint Elias Church is only 54 m away from Road K5). Some roads include as well sections that are in close proximity to agricultural terraces (e.g. Road K3, K6 (in Bzumar) and K1 (in Aajaltoun, Faytroun, Faraya and Kfardibian), whereas others are in close proximity to schools (e.g. Saint Roch School is 42 m away from Road K1and Ajaltoun technical school is only 70 m away from Road K3) and hospitals (e.g. KMC hospital is located 170 m away from road K5), and Bouar public hospital (located 210m away from road K5). Agricultural lands, which bordering the study roads could be affected in case of mismanagement (e.g., dust accumulation on nearby agricultural lands and terraces) and shop owners, patients, and students could be highly affected, in case of improper implementation of the ESMP and lack of adequate application of the Traffic Management Plan (TMP).

Impacts Evaluation

At this stage, as the exact roads to be maintained are not yet determined, impacts were assessed at the Caza level, including the representative roads, for all activities under the scope of work, and worst-case scenario impacts were considered.

Environmental impacts are expected to be localized and moderate. Moreover, given that the project aims to upgrade existing roads, environmental impacts are mainly limited to dust emissions and degradation of soil and water quality, if activities were not managed properly. Despite the temporary and localized nature of routine maintenance works, dust and odor emissions are expected to be high during works execution. Moreover, potential impacts on water and soil quality along assessed roads due to potential accidental spillages and contaminated storm water runoff, are expected to be of medium significance (rivers were recorded in the study area and nearly all roads in Kesrouane Caza lie on permeable formations). In other words, road sections where the subsurface has a high transmissivity and is sensitive in terms of contamination, care should be taken, and activities (including waste management) should be closely monitored to avoid groundwater contamination.

In addition to the expected temporary disturbance of the natural ecosystems (dust accumulation on roadside vegetation, noise pollution, increase in traffic, and accidental spills with subsequent ecosystem impairment), direct destruction of vegetation and population might occur if wastes (e.g., excavated materials) were directly discharged into the roadside ecosystems. Special care is needed when the adjacent habitats to roads involves riparian habitats, oak maquis, dense pine

patches or rocky habitats. However, it is important to mention that the adjacent areas to the assessed roads, which are rich in terms of biodiversity, are limited due to the urbanized nature of these roads (namely highways).

Potential social risks related to the project include (a) labor influx (in case the Contractor didn't recruit labor from the surrounding community), (b) potential risk of labor induced Sexual Harassment (SH) towards female workers and Sexual Exploitation and Abuse (SEA) towards women in the surrounding community; (c) potential risk of child labor; (d) inadequate labor conditions, (e) dissatisfaction with job allocation; (f) risk of under-participation or underemployment of women; (g) nuisance, traffic disturbance and temporary obstruction of access routes to sensitive receptors (e.g., obstruction of access to residential units, schools and shops and dust accumulation on nearby receptors/receiving environment). Specifically, the impact assessment indicates that GBV risk (SEA/SH) is high due to the close proximity of human settlements to Kesrouane primary roads/highways. Similarly, traffic disturbance is expected to be high knowing that the majority of assessed roads are urbanized with medium to high traffic volume. As a result, there is an anticipated significant risk of traffic-related accidents and injuries to workers and local communities if adequate precautions, control measures, and a comprehensive Traffic Management Plan (TMP) are not implemented, including a dedicated plan for highways such as K5 and BR-1.

Potential positive environmental impacts of the routine maintenance activities, if activities were managed properly, are associated with enhanced road conditions. For instance, improved drainage will decrease blockages, improve surface storm water run-off, and control erosion, which in turn reduces the risk of water stagnation which can damage road pavement and is associated with several waterborne diseases. Additionally, the project will improve the safety conditions of the roads through repair of pavements, safety barriers, and retaining walls. Most importantly, the project will create short-term employment opportunities to local residents and Syrian refugees who will execute earthworks.

Development of the ESMP

This ESMP provides avoidance and mitigation measures to identified impacts. The aim is to assist the project Contractor to reduce the footprint of its operations in Kesrouane and to ultimately achieve REP expectations regarding environmental and social performance.

Measures to control exhaust emissions, dust and odor emissions, and soil manipulation activities during the execution of work are provided. Moreover, proper measures and guidelines on the control of accidental spills of construction materials are provided including specific/stricter measures to critical segments of roads (i.e. where roads are crossed or are in close proximity to rivers or particular biotopes). Regarding biodiversity, provided recommendations to guide the project Contractor in reducing the negative impacts on natural habitats and biodiversity are namely related to waste management. Contractors must be careful so that the direct impacts (direct destruction) on rich ecosystems and associated fauna would be minimal. In other words, waste should not be dumped into the adjacent natural habitats (e.g. woodlots, valleys, and rivers). Soil and water contamination could have irreversible impacts on biodiversity. Finally, activities near oak forests, dense pine patches and forests (e.g. along Road K6 Daroun and Harissa); rocky outcrops (e.g. along Road K1 in Kfardebian) and rocky slopes and plateau (e.g. the Jurd in Oyoun el Siman) should be planned carefully and buffer zones must be created if needed.

The social risks of this project can be mitigated through periodic monitoring of labor conditions, specific required clauses within contracts that protect workers and the Code of Conduct (CoC) for Gender Based Violence (GBV) issues. This ESMP guides the contractor to preferably hire local workers, not to hire individuals below the legal working age in accordance with the labor law of Lebanon, and ensure proper implementation of the CoC. Further, close coordination with the concerned municipalities is recommended in relation to road obstruction issues and REP GRM must be clearly communicated to all stakeholders during and before project implementation. The traffic management plan shall be implemented, as first stage before starting works. For example, during the execution of maintenance activities including repair of joints (BR-1), the traffic shall be diverted to the edge lanes or to service lanes in a safe manner, ensuring the continuity of traffic circulation with an acceptable flow. Similarly, Health & Safety (H&S) risks can be mitigated through precaution and control measures including the development/implementation of site-specific safety and traffic management plans.

Further, the ESMP provides key/measurable project indicators to monitor the detected risks. Project monitoring will be undertaken CDR (i.e. Supervisor Consultant) to ensure compliance and performance. Project progress reports will be prepared by CDR and submitted to the WB for review.

Public Consultation

The ESMP underwent a comprehensive public consultation process with key stakeholders to ensure agreement on sensitive issues and prevent last-minute disputes.

An inclusive public participation meeting was organized for Kesrouane Caza, at Jounieh municipality building on Friday July 28, attended by 17 people, including six women.

During the meeting, participants were informed about the project's objectives, design, important local resources, potential risks, and mitigation plans. The project's Grievance Redress Mechanism (GRM) was introduced.

A focal point of discussion during the meeting was the road selection process for routine maintenance activities, with considerations for the inclusion of non-primary roads within the project scope. The Consultant provided a detailed explanation of the selection process and underscored that due to budget constraints, international and primary roads would be given precedence. In response to this, municipalities expressed their intention to submit formal request letters to the MoWT for the assessment of specific roads, some of which were shared by municipality representatives during the public participation meeting to be examined by the Consultant Engineer.

Positive feedback on REP phase 1 came from Kfour municipality, and the YASA director emphasized on the importance of private initiatives in supporting road maintenance.

Lastly, attendees were assured that relevant municipalities would be informed in advance of project commencement, and a public notice detailing the GRM procedure would be posted in each relevant municipality to ensure transparency in project implementation.

Project GRM The purpose of a grievance mechanism is to ensure that all feedback and complaints received from stakeholders, employees, contractor staff and the public in general are documented, considered and addressed in an acceptable and timely manner.

The REP GRM has been established and is already accessible to communities to send their concerns and complaints. Citizens will be informed about the GRM mechanism before commencement of work through municipalities (i.e. through public announcement letters that will be posted at the public board of concerned municipalities including the number of Contractor's site engineer to be contacted and also through project sign boards). This multi-channeled GRM has three levels:

- Level 1: If any person has any complaint or concern regarding the project implementation, he/she can lodge an oral or written grievance to the site Manager. In case an oral complaint is made, it should be written by the Contractor Social expert. The issue must be resolved within a maximum duration of one week.
- Level 2: If the person is not satisfied with the action of the Contractor, he/ she can send the complaint to the PIU social specialist through Phone: 01980096 ext:317, Email: GRM.REP@cdr.gov.lb or official letter registered at the CDR. The issue shall be resolved within a maximum of two weeks.
- Level 3: If the person is not satisfied with the decision of the social specialist of PIU, he or she can bring the complaint to the attention of the PIU Director's Office. Once the PIU Director receives the complaint, it needs to be resolved within a maximum of two weeks. Citizen can also register an official letter at the CDR (Address: Tallet al Serail - Riad el Solh, Beirut – Lebanon).

The GRM for internal employees follows a similar structure, but with different contact people for each level. Level 1 involves the health and safety officer and E&S expert, and Level 2 is reported to the PIU Director, with the same one-week resolution timeframe

Conclusion

Assessments showed that the project risks can be mitigated if the Contractor succeeded in implementing this ESMP, which documents the project's risks management strategy. In order to achieve that, CDR has to oversee the implementation of this strategy by the Contractor.

Accordingly, if the Contractor succeeded in complying with the WB environmental and social standards and in ensuring a safe operation of activities, the project is expected to enhance the safety conditions of the select roads and most importantly create short-term jobs for the Lebanese and Syrians.

1 Introduction

1.1 Project Background

The Lebanon REP is a WB funded project that aims to improve transport connectivity along select paved road sections and create short-term jobs for the Lebanese and Syrians. The REP was approved by the WB Board of Executive Directors in February 2017 and ratified by the Lebanese Parliament in October 2018.

The Lebanon REP is a WB funded project that aims to improve transport connectivity along select paved road sections and create short-term jobs for the Lebanese and Syrians, and support farmers engaged in crop and livestock production.

The REP was approved by the WB Board of Executive Directors in February 2017 and ratified by the Lebanese Parliament in October 2018.

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 originally had three components. Following its restructuring in March 2021, a fourth component was added to address the impact of the COVID-19 on the agriculture sector. REP components are as follows:

(i) Roads Rehabilitation and Maintenance (US$178 million): to finance works and related consultancy services for the rehabilitation and maintenance of about 500 km of primary, secondary, and tertiary roads, including road safety and spot improvements and repair of damaged expansions joints on highways/primary roads;
(ii) Improvement of the MoPWT' Road Emergency Response Capacity (US$4.5 million), especially during climate extremes;
(iii) Capacity Building and Implementation Support (US$7.5 million): to build the capacity of Lebanese agencies in planning and managing the road sector; and
(iv) Support to farmers engaged in crop and livestock production (US$10 million): to support continued agricultural production and vaccination of animals.

Accordingly, the REP ESMF was updated using an Addendum that can be found here https://www.cdr.gov.lb/getmedia/4254c2bd-3c63-4dfc-aeb7-dfb78eaada4f/REP-Component-4-ESMF_Vol-1_for-Disclosure_20210608.pdf.aspx.

This ESMP only deals with the first component of REP that aims at (a) rehabilitating, upgrading, and maintaining selected primary (including International Roads/Highways), secondary and tertiary roads, (b) providing technical assistance for the design, procurement, and supervision of said sub-projects, and (c) preparing safeguards instruments for the Project. More specifically, this ESMP that was prepared by Dar Al Handasah Nazih Taleb & Partners, which was assigned by CDR to prepare all the tender documents needed for the rehabilitation and maintenance works of the roads located within Kesrouane Caza under CDR contracts No.20832, aims to effectively address the environmental and social challenges linked to the envisaged routine maintenance

activities in Lot 15- Kesrouane Caza, primarily targeting the maintenance of primary roads/Highways, which includes the repair of expansion joints on the highways.

It is important to note that REP Environmental and Social Management Framework (ESMF) (https://www.cdr.gov.lb/CDR/media/CDR/StudiesandReports/Roads%20and%20Employment/ESMF.pdf) which was cleared by the WB and disclosed in April 2018 identified the potential environmental and social aspects associated with the project as well as the recommended respective management and monitoring measures.

Furthermore, the project's Resettlement (RPF) cleared by the WB and disclosed in April 2018 (https://www.cdr.gov.lb/CDR/media/CDR/StudiesandReports/Roads%20and%20Employment/RPF.pdf) outlined the principles for resettlement impact mitigation as well as the organizational arrangements needed during project preparation and implementation; it also included the compensation measures that need to be implemented for any Project Affected Persons (PAPs) for any possible loss of land, properties or livelihoods.

Moreover, 25 site-specific ESMPs were prepared between 2019 and 2020, consulted upon, cleared by the WB and disclosed on the CDR and the WB websites. This includes the Kesrouane-specific ESMP prepared by Dar Al Handasah Nazih Taleb & Partners covering roads that were selected by the Lebanese Government for full rehabilitation works (ESMP for Kesrouane Caza is available on CDR Website via the following link: https://www.cdr.gov.lb/CDR/media/CDR/StudiesandReports/Roads%20and%20Employment/Caza/Kesrouan_Final-ESMP.pdf

To manage the environmental and social risks associated with the addition of routine maintenance activities in Lot 15 - Kesrouane Caza, primarily targeting the maintenance of primary roads/highways, including the repair of expansion joints of Adma interchange, relevant mitigation measures as well as necessary institutional arrangements was covered through this specific ESMP Report.

1.2 Project Rationale

According to Schwab, 2017, in terms of road connectivity, Lebanon ranked 95 and achieved a poor connectivity score index of 48.7 out of 100. As for the road conditions, approximately 95% of the roads are paved but lack proper maintenance. In this context, to deal with increasing safety challenges, the Lebanese Government is implementing REP that among its stated objectives mentioned above, aims to enhance transport connectivity and safety along specific roads.

However, infrastructure projects can exert a substantial strain on the environment and natural resources. Only with sustainable practices and proper waste management plans enforced, the burden on the environment can be reduced. Sustainable projects can generally be achieved by considering the environmental impact of the construction process (Hoeckman et al., 2012).

Similarly, the socio-economic effects of infrastructure projects can be reduced through transparency and fair compensation processes (Morris, 2007). In this context, this ESMP for routine maintenance works in Kesrouane Caza was prepared by Dar Al Handasah Nazih Taleb & Partners for development decision to go hand in hand with environmental and social protection. Routine maintenance activities did not require changing the environmental and social

safeguard category of REP. Therefore, this ESMP is under the requirements of WB OP4.01, that classifies the project as Category B.

1.3 Report Objectives

The main aim of this ESMP for Kesrouane Caza, is to stipulate the control measures required to manage and monitor the project environmental, social, and H&S risks in accordance with environmental laws and regulations in Lebanon and the WB guidelines.

This ESMP will serve as a practical tool for the project Contractor who is supposed to implement the devised management strategy to (1) reduce the footprint of REP's operations in Kesrouane Caza and (2) ensure safe operation of activities and prevent injuries to workers or the public. To reach the above-mentioned objective, the ESMP will:

1. Describe all activities of the project
2. Establish environmental and socio-economic baseline within the study area
3. Identify relevant environmental and social National Legal and Institutional Standards & WB Policies and regulations
4. Conduct an inclusive public consultation session that takes into consideration the views of Project Affected Persons (PAPs) to feed the project design and management plan;
5. Identify potential social, environmental, and H&S impacts associated with the implementation of the proposed project;
6. Propose feasible and applicable mitigation measures for the identified impacts;
7. Develop a plan to monitor the identified impacts and their associated mitigation measures;
8. Guide on creating short term jobs for communities within a gender workforce equality environment;
9. Identify the responsible authorities and assign roles for different organizations in the efficient implementation of this ESMP;
10. Implement a robust GRM that is multi-channeled and fully functional and that is clearly communicated to all PAPs.

1.4 Methodology

This ESMP encompasses the planned routine maintenance activities for primary roads and highways in Kesrouane. It was prepared by **TIVÈL Consultancy** in response to Dar Al Handasah Nazih Taleb & Partners's request and serves as a comprehensive documentation of the project's risk management strategy.

The methods used for setting the data collection, stakeholders' engagement, and impact assessment are elaborated in this section.

1.4.1 Collection of Environmental and Social Baseline information

Baseline data were collected from field surveys, previously conducted assessments in Kesrouane Caza under REP, and generated GIS maps. Meteorological data, which play a vital role in transport and dispersion of air pollutants, were investigated and collected in shape of a statistical distribution of weather conditions over a period of time. Also, the ambient air quality for the

study area was examined to assess the social wellbeing and health status of Kesrouane community. A geospatial analysis was performed to indicate the percentages distribution of geological outcrops and hydrogeological classes at Kesrouane Caza and along concerned highways/primary road alignments. Similarly, a Land Use Land Cover (LULC) analysis was conducted to better understand the percentage distribution of LULC at the Caza level and alon road alignments. Results were then compiled with site visit observations. Regarding the social assessment, socio-economic information about Kesrouane Caza was obtained from several national sources, as well as from the Ministry of Social Affairs (MoSA) and previous REP studies for Kesrouane Caza. Finally, a list of main sensitive receptors was generated to better determine the PAPs.

1.4.2 Methodlogy for Stakeholders Engagement

The Stakeholder Circle methodology (Bourne, 2016) was used for defining the stakeholder community and recognizing the communication needed to influence each stakeholder's prospects and actions. Stakeholders were first identified, prioritized, and then engaged through directed communication. Emails, letters, and direct phone calls were adopted to personalize the communication with main recognized stakeholders. Finally, a formal invitation letter was sent to all stakeholders in relation to the arranged formal public meeting at the Jounieh municipality building on Friday July 28, 2023.

1.4.3 Methodology for Impact Assessment

At this stage, as the exact roads to be maintained are not yet determined, impacts were assessed at the Caza level, including the representative roads, for all activities under the scope of work, and worst-case scenario impacts were considered. The adopted grading methodology is detailed in Annex 3.

More specifically, knowing that drainage works, pavement repair works, and removal/installation of concrete structures are the riskiest of the whole spectrum of routine maintenance activities (Huang et al., 2009), the "worst-case scenario" impacts were considered. Further, given that impacts are directly affected by the environmental and social conditions of the surrounding environment/adjacent areas to target roads, stricter mitigation measures were provided for segments of roads that are critical in terms of transmissivity, proximity to river, proximity to sensitive receptors, and proximity to critical natural habitats.

Based on the above, this ESMP was developed and included a monitoring plan, which is needed to ensure compliance of the project with environmental and social conditions and regulations. Based on the current institutional setup of the Roads and Employment Project, the institutional setup and the requirements for capacity development was described to ensure that project implementers have sufficient technical and human resources available to effectively undertake the environmental and social management and monitoring tasks.

2 Existing Policies, Legal and Administrative Framework

2.1 Legal Framework

Similarly, to all the developed ESMPs within the REP project, this ESMP is conducted in accordance with the WB Safeguards and national and international laws/regulations that are

related to environmental and social impact assessments (namely law 444 for the protection of environment, Laws 77 and 78 in relation to water and air protection, Law 80 and Decree 5605 on solid waste management, and the decisions on environmental standards that are elaborated in section 2.3). REP works contracts must comply with the national law on labor and the ILO obligations, which have been ratified by Lebanon (Penal code decree 340/1943; Labor Law/1946: The Lebanese Labor Code, Law No. 335/2001: Pursuant to the International Labor Organization ILO Convention No 182; Law 400 – 2002: Ratification of ILO convention No. 138, Decree 8987 – 2012; Law 205 – 2020; Law 28/2017, Decree 6940/2020; Decree 8987/2012: Prohibition of employment of minors under the age of 18; and Decree 3791/2016: Minimum Wage). Finally, Occupational Health and Safety (OHS) laws must be applied as well to avoid adverse impacts on workers. An overview of the main Lebanese environmental and occupational legislations is provided in Table A in Annex 1.

2.2 Institutional Framework

The project is implemented by the CDR in coordination with the MoPWT. The other main national institutions that are in relation to REP include (1) municipalities in Kesrouane Caza that were consulted at this stage of the project and they will supervise projects' implementation in their municipal territories; and (2) relevant ministries and governmental departments (e.g., Ministry of Environment (MoE), Ministry of Energy and Water (MoEW), Internal Security Forces/traffic department) that must be consulted when needed before and during project implementation in relation to hazardous waste management, water, electricity, and traffic matters (these institutions and their corresponding mandates are presented in Table B, in Annex 1).

2.3 Environmental Standards

Environmental standards that must be respected by the project Contractor are provided in this section. The Lebanese wastewater emission standards are less strict than the WB standards, but stricter for ambient air quality and similar for noise. In this context, during works execution, the stricter limits must be followed.

Allowable Wastewater Discharge

The allowable discharge requirement as specified by WB are presented in Table 2-1.

Table 2-1 Allowable wastewater discharge levels (WB requirements)

Wastewater Effluent Pollutants Threshold	
Parameters/pollutant	**WB requirements**
pH	6 – 9
BOD mg/l	30
COD mg/l	125
temperature Co	-
Total nitrogen mg/l	10
Total phosphorus mg/l	2
Oil and grease mg/l	10
Mercury mg/l	0.01
Total suspended solids mg/l	50
Total coliform bacteria (Most Probable Number/100 ml)	400

Air Emissions Targets

According to Decision 16/1 dated 2022, the maximum allowable limits for generators with capacity >=200 kW (or >=60 kVA) are shown in the below table.

Table 2-2 Reciprocating engine generator with capacity >=200 kW (or >=60 kVA)

Monitoring Parameter	Maximum Allowable Limits (mg/Nm^3)	Fuel type	Measurement Frequency
Dust	50	-	Continuous • Mandatory if capacity >=10MW • Optional if capacity <10MW
CO	100	-	
NO_2	2,000	-	
SO_2	10	Diesel	
	750	Other	

Noise Emissions Targets

The expected noise pollution levels should not exceed the values listed in the MoE Decision 52/1 dated 1996. The limited; values are presented in the table below.

Table 2-3 Sound pressure limits (MoE Decision 52/1, 1996)

Phase	Sound Pressure Level dB(A)
Working Location (less than 8 working hrs.)	90
Working Location (requires good speech hearing)	80

Therefore, the maximum national standard of 90 (dB) for occupational noise exposure limits should not exceed an average duration of 8 hours working days. If the limits are higher than the acceptable limits, then the exposure duration should be reduced as mentioned in the table below.

Table 2-4 Noise exposure limits (MoE Decision 52/1,1996)

Sound Pressure Level dB(A)	Exposure Duration (hrs.)
95	4
100	2
105	1
110	0.5
115	0.25

Moreover, the following table indicates the Lebanese noise guidelines in different zones and at different periods of the day.

Table 2-5 Lebanese noise guidelines for different zones (MoE 52/1, 1996)

Area classification	Maximum accepted noise level dB(A)		
	Day[1]	Evening[2]	Night[3]
Residential area with few construction sites, activities or on a highway	50 – 60	45 – 55	40 – 50
Urban residential area	45 – 55	40 – 50	35 – 45
Residential suburb	40 – 50	35 – 45	30 – 40
Rural residential, hospital, public garden	35 – 45	30 – 40	25 – 35
Industrial zone	60 – 70	55 - 65	50 - 60
(1) 7 a.m. to 6 p.m. (2) 6 p.m. to 10 p.m. (3) 10 p.m. to 7 a.m.			

2.4 World Bank Policies and Guidelines

2.4.1 Safeguard Policies

The ESMP for Kesrouane Caza should comply with the safeguard policy of the WB, 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 road infrastructures and associated civil works. Under the requirements of OP4.01, the proposed project is classified as Category B. Impacts have no severe effects on the environment and can be mitigated via an environmentaland social management plan.

Despite that OP 4.12 was triggered by this project and RPF was accordingly prepared (disclosed on the CDR website), in the context of Kesrouane and in accordance with site specific plans, no involuntary resettlement or land acquisition will take place. In other words, the project will be implemented primarily within the existing "right of way" and there will be no displaced persons by the project activities (this includes local and Syrian refugees).

2.4.2 Access to Information, Consultations and Disclosure Policy

The WB allows access to any information in its possession that is not on a list of exceptions. Moreover, transparency is essential to building and maintaining communal dialogue, and increasing public awareness about the WBG's development role and mission. In this context, a formal consultation process with the public took place during the preparation of this ESMP for Kesrouane Caza (refer to section 7.1). Moreover, this ESMP will be disclosed on CDR's and concerned municipalities' website.

3 Description of the Proposed Project

3.1 Project Scope and Location

The project comprises routine maintenance activities in Lot 13 - Kesrouane Caza, primarily targeting the maintenance of primary roads, including International roads that range from one lane in each direction with low traffic volume to multiple lanes in each direction with high traffic density, known as Highways. This includes the repair of expansion joints for Adma interchange. Secondary roads will be considered if there is sufficient budget.

To assess the roads' conditions, a comprehensive evaluation was conducted at the Caza level, focusing on five representative roads (refer to Table 3-1 and Figure 3-1 and Figure 3-2) (The total length of these roads is around 95 km) and on Adma interchange (refer to Figure 3-3), as detailed in separate technical reports prepared by Engineer Dar Al Handasah Nazih Taleb & Partners.

Figure 3-1 Kesrouane Caza primary roads

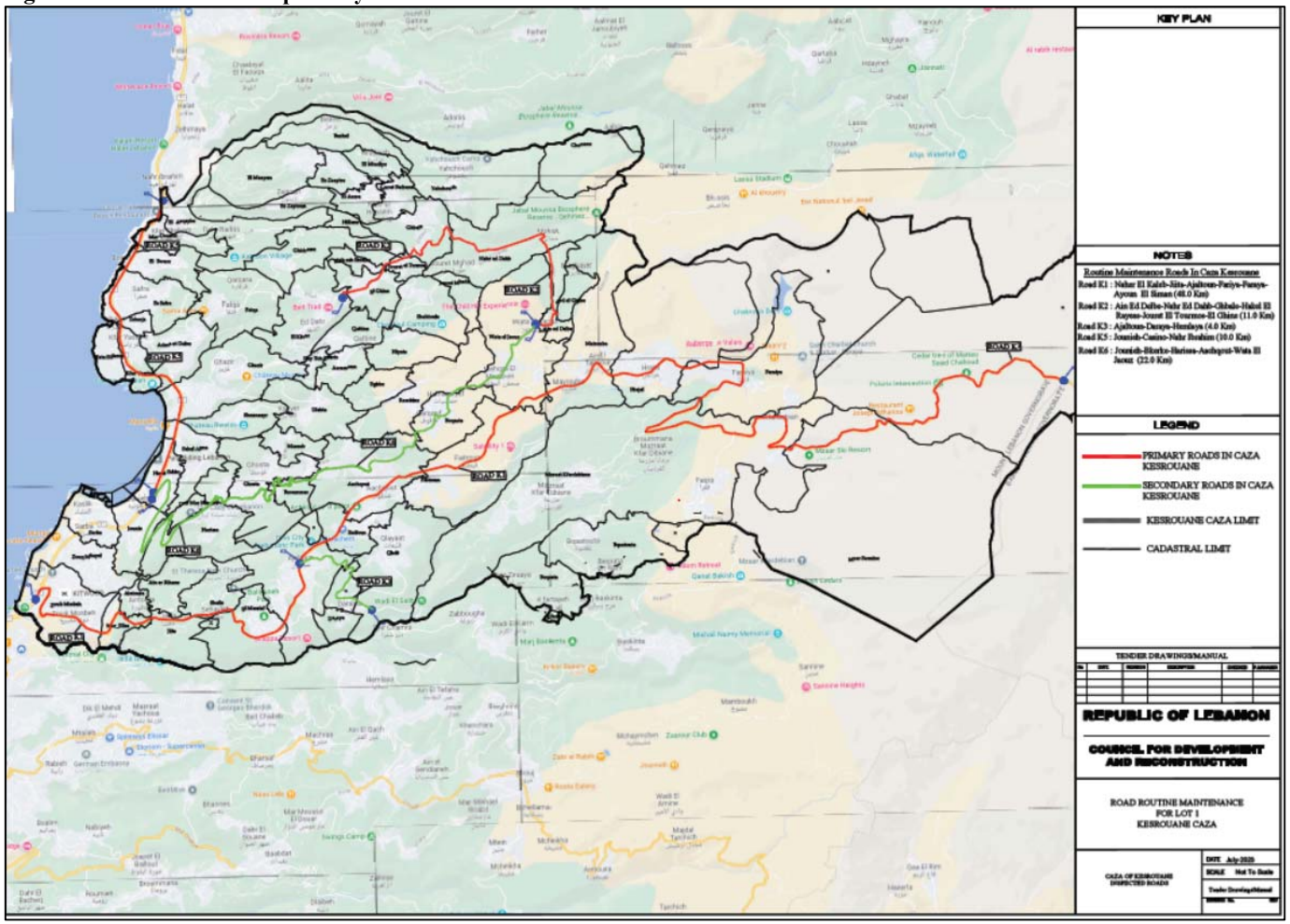


Figure 3-2 Kesrouane Caza representative roads

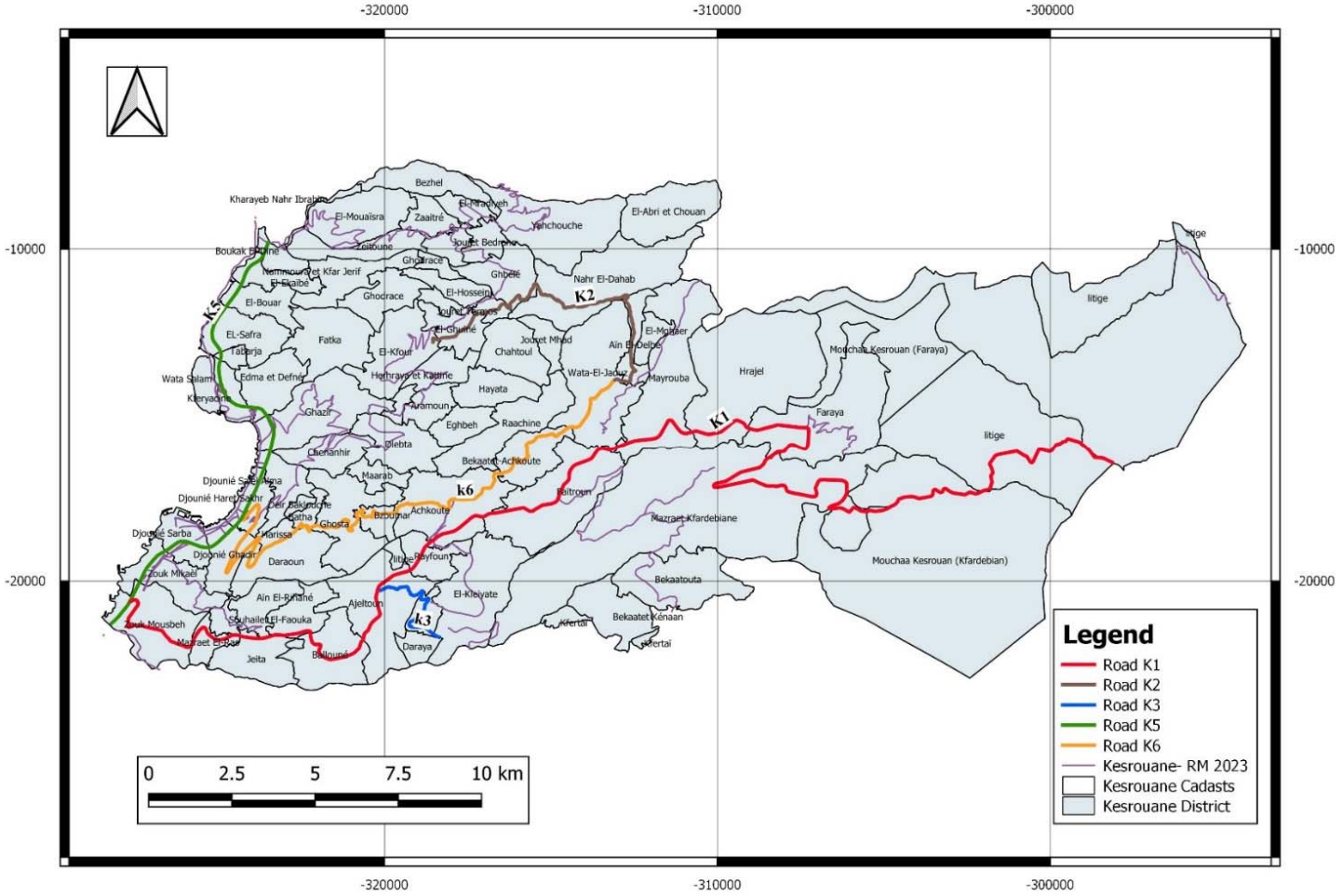


Table 3-1 Representative roads in Kesrouane Caza

Road name	Description	Classification
Road K1	Naher el Kaleb- Ajaltoun- Faraya – Oyoun El Siman (48 km)	Primary
Road K2	Ain Ed Delbe – Nahr Ed Dahb- Jouret el Tourmous – El Ghine (11 km)	Pirmary
Road K3	Aajaltoun – Daraya – Hemlaya (4km)	Primary
Road K5	Jounieh – Casino Nahr Ibrahim (10 km)	Highway
Road K6	Jounieh –Bkerke – Harissa – Aachqout – Wata El Jaouz (22 km)	Secondary

Figure 3-3 Adma Interchange

3.2 Project Activities

The envisaged general roadway repair works within Kesrouane Caza were grouped into incidental repair works, pavement repair works, concrete repair works, installation of channelizing devices and traffic control devices, and repair of expansion joints (Table 3-2).

Table 3-2 Envisaged routine maintenance activities for Kesrouane

Category	Maintenance Activity
1. Incidental repair works	• Clearing and grubbing • Repair of damaged manhole covers • Repair of Masonry wall • Cleaning of waterways, hydraulic structures, drainage pipes, and box culverts,
2. Pavement repair works	• Pavement overlay, for a limited area, consists of paving over the existing roadway to cover cracks, fill potholes and increase the strength of the roadway • Shallow patching works, for a limited section, includes removing the existing pavement (milling); generally, between 4 to 5 cm, and paving the area that was milled • Deep patching works, for a limited section, may be needed when the structural integrity of the road is compromised. Including excavation, base course (30 cm), prime coat, asphalt binder course, tack coat and asphalt wearing courses • Crack sealing • Milling & overlay for sunken but stable trench, width less than 1 m including tack coat • Removal and reinstatement of damaged trench width less than 1 m including excavation, base course (30cm), prime coat, asphalt binder course, tack coat and asphalt wearing courses
3. Concrete repair works	• Repair of box culverts, headwalls, concrete channel, concrete safety barrier, retaining walls, and cover channels
4. Installation of Traffic control devices	• Installation of thermoplastic reflectorized road paint lines including surface preparation and removal of existing paint lines (where needed) • Installation of thermoplastic reflectorized special road marking including speed limit marking, cats eye, pavement studs, bituminous speed humps; rumble strips; delineators and makers posts; temporary traffic signs, barricade with flashers etc.
5. Temporary Channelizing Devices	• Installation and reinstallation of concrete barrier, removable single face concrete safety barrier, or removable double face concrete safety barrier.
6. Maintenance/repair of existing highway expansion joints	Works will be subject to the state of defect which is described based on two folds: • In case of slight defect: the repair of existing joints consists of replacing the damaged parts of joint and restoring/repairing the deteriorated parts of anchorage systems without full replacement of existing joints. • In case of complete defect: the rehabilitation of deck expansion joints includes mainly replacing the existing one by a similar type of joint according to the method statement presented hereafter. The majority of highway joints under this scope of work are reinforced elastomeric joints and the required maintenance works consist mainly of fully/partially replacing the damaged joint with a new one having similar technical specifications. The execution of required works can be classified as a simple maintenance activity that will be carried out with a limited number of labourers (between

5 & 8 workers for each joint bridge), light machine (pick-up truck, bobcat), and in a quick time (not to exceed two weeks per bridge). It will include the following activities:

- Install as necessary the temporary signing and channelizing devices for the traffic control plan in the working area.
- Remove of the existing expansion joints, all related materials and accessories.
- Repairing as required the area below the expansion joint (Utilization of Epoxy mortar for steel anchor).
- Install Joint including drill and fixation of anchor bolts by Epoxy resin.
- Asphalt Surface from both sides (max. of 1 meter) of the expansion joint as needed.
- Clean and fill the transition strip on both sides of the expansion joints.
- Remove the temporary signing and channelizing devices for the traffic control

The following photos illustrate the current conditions of Adma interchange, that is under the project scope, and the methods and the main activities in the maintenance of reinforced elastomeric joints (from other projects similar to this scope of works).

Photo 1 current conditions of Adma interchange joints

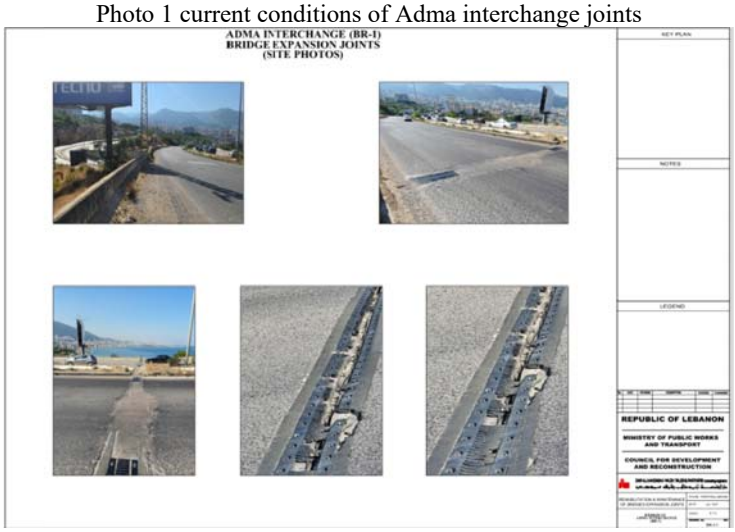
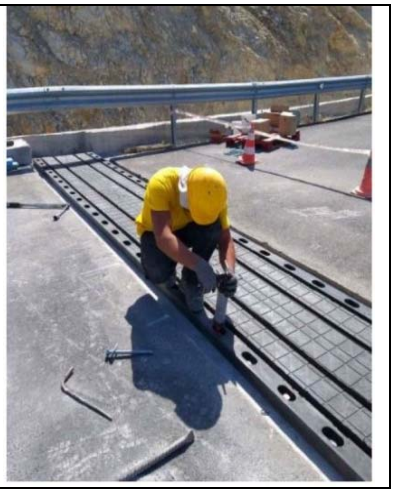


Photo 2 Levelling of surface below the expansion joint

Photo 3 Joint Installation

3.3 Equipment and Materials/Items

Typical equipment used for routine maintenance activities include shovel, grass cutter, wheel roller, crusher, grader, paver, compacting equipment (compactor/roller), milling machines, cleaning machines, lifting devices etc. A typical tabular format, which shows the raw materials and items needed for the routine maintenance activities, is presented in Table D in Annex 1.

3.4 Staffing and Site Facilities

Routine maintenance activities are typically of small scale (i.e., activities will occur on a small section of the road), but widely dispersed, and most of them require skilled and unskilled manpower. The number of required unskilled workers (laborers) needed to perform repair works on-site will depend on each maintenance activity and on the timing of works. In this context, and as an indicative number only, the number of workers is estimated to be 20 workers for normal days and can increase to reach up to 30 workers during the peak maintenance period (e.g., before the rainy season). Accordingly, the Contractor will be encouraged to hire laborers from the local community living in the project area (with an equitable distribution between Lebanese and Syrian). The Contractor's skilled labors include environmental, social, and OHS experts who will be responsible of the implementation of this ESMP in collaboration with project manager, site engineers, and site officers. They will also train non-skilled workers on how to follow the safeguards requirements.

The Project site will not include labor camps, lodging on site, and repair garages. During the implementation phase, the Contractor will have to rent a flat located in the Project area to serve as a project office. The office will be fully used by the Contractor Engineers, technical skilled workers and the Supervising Consultant. The flat will be equipped with toilet, kitchen (including drinking water and appliances), lockers and other supplies needed for the daily administrative activities. If applicable, the on-site rest point will be decided by the Contractor at the time of works. Finally, the Contractor will have to service the on-site with a portable cabin toilet. The porta cabin will be mobile and its placement depends on the work zone (wastewater management in relation to the porta cabin are provided in Table 5-1).

4 Description of the Environment and Social Context

Existing conditions within the area of influence were recorded prior the project implementation. This data was then analyzed for impact prediction and assessment. Baseline data covers the status of the following receptors: air quality, water/soil quality, hydrogeological conditions, climate and meteorology, natural habitats, land-use/land-cover, and socio-economic conditions.

4.1 Physical Environment

4.1.1 Topography

Roads under consideration are located in Kesrouane Caza. Primary roads start off at the coast and ascend east into the mountains. Attitude approximately range between 10 m to 2,500 m (refer to topography map for Kesrouane Caza in Figure A in Annex 2). BR-1 is located 70 m above sea level with a height of 10 m. The variation of surface elevation of representative roads in Kesrouane Caza is presented in the table below:

Table 4-1 Variation of surface elevation of representative roads in Kesrouane Caza

Road Alignment	Elevation (m)		
	Min	Max	Mean
K1	27	2113	1,246
K2	895	1289	1029
K3	718	898	832
K5	13	102	40
K6	28	1366	816

4.1.2 Subsurface and Surface Conditions

The geology at the Caza level 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 Kesrouane roads mostly fall on a karstic limestone formation. The system is characterized by a significant amount of groundwater flowing in channels, faults and fractures. The transmissivity of these formations is generally high and water table is shallow. In other words, nearly all roads in Kesrouane lie on permeable formations which expose the groundwater aquifers to possible contamination (e.g. K3 falls 100% over J6).

More specifically, the outcropping lithological formations in and around the study area belong to multiple geological time periods namely, to the Cretaceous (46%) and Jurassic (31%) geological time periods. Some roads are very rich in winter drainage channels that discharge downstream to “Wadi Tabarja” and “Wadi Ghazir, others intersect with Nahr Ibrahim, Nahr el Kaleb and Wadi Jounieh. Finally, some roads are surrounded by several surface winter drainage channels which lead downstream to “El Kaleb” river.

4.1.2.1 Geological Outcrops:

The geology of the studied area was investigated for outcropping formations, subsurface stratigraphy, hydrogeology and hydrology. The summary of the geological outcrops exposed in the study are listed and described in Table E in Annex 2. Additionally, in order to obtain a

better understanding of the geology in the area, a geospatial analysis (Figure B in Annex 2) was performed to indicate the percentages of geological outcrops encountered at the Caza level.

For example, road K3 sits entirely (100%) over a J6 Jurassic and all other roads K1, K2, K5, and K6 are more than 70% sitting on Jurassic and cretaceous formations.

4.1.2.2 Hydrogeological Conditions:

Geological units can be defined as aquifer or aquiclude in term of storing and transmitting water, and these types depend on the geological environment in which they occur. In summary, in terms of hydro-stratigraphy, the project covers several classes:

- Karstic limestone formation represented as 1,2, and 3 in Figure C and described in Table G (in Annex 2): these types of formations **are highly susceptible to contamination** in the event of mismanagement of generated wastes due to the shallow water table and easy subsurface water flow which enhances spread of contamination when it occurs.
- In-porous formation represented as 5, 10, and 11 in Figure C these types of formations typically limit subsurface water flow and therefore any contamination that manages to infiltrate to the subsurface is highly unlikely to spread.

Similar to the geological analysis, a hydrogeological analysis was done to determine the percentage distribution of hydrogeological classes at the Caza level; where more than 75% consists of karstic and high transmissivity formations with wide and rich water table and similar statistics are found for each individual road as shown in (Table H and Table G in Annex 2).

For example, Road K3 sits entirely (100%) over a class 1 Jurassic formation and high transmissivity formation and all other roads K1, K2, K5, and K6 are more than 70% sitting on karstic high transmissivity formations, which facilitates and increases the risk of water contamination in the area.

4.1.2.3 Surface Water

The main rivers in Kesrouane are: “El Kaleb” river (Nahr El Kaleb); Ibrahim river (Nahr Ibrahim); “Wadi Tabarja”; “Wadi Ghazir”; and ‘Wadi Jounieh’.

The general surface layout map of Kesrouane Caza is shown in Figure C in Annex 2 and in Table I for the representative roads. For instance, the assessment shows that Road K5: intersects with Nahr el Kalb, Wadi Jounieh, Wadi Ghazir river, Wadi Tabarja and Ibrahim river. Whereas, Road K6 runs parallel intersects with Wadi jounieh river in Achkoute and Bekaatet Achkoute and Road K1 intersects with the Nahr Ibrahim river several times in Faraya, Mazraat Kfardebian, and Mchee Kesrouane (Kfardebian).whereas, the main springs recorded in Kesrouane Caza with respect to road alignments are presented in Figure D and Table J in Annex 2. For instance, the notable springs include Naabaa el Asal (251 m away from Road K1), Nabaa el Laban (947 m away from Road K1), and Ain Ed Delbe (10 m away from Road K2).

4.1.3 Climate

The climate and meteorological parameters play a vital role in transport and dispersion of pollutants in the atmosphere. One of the most significant meteorological parameters that influence project activities is precipitation due to its ability to enhance the infiltration of accidental spills and contaminated construction wastewater within the area depending on site operation procedures. The total precipitation ranges between 919mm at coastal area (lowest point) and 1,043 mm at mountain (highest point) whereas, the hottest month in the area is August (31.19 ºC) and coldest month is January (-2.13 ºC) (CHIRPS and MODIS satellites).

4.1.4 Ambient Air

Air quality is an essential component in assessing social wellbeing and health status of a community. Atmospheric air quality data was collected from the Sentinel 5P Tropomi Satellite which provides daily near real time data for various gases in the atmosphere. The mean tropospheric NO2 column density was calculated using the Google earth engine code java script editor resulting in Figure E Distribution of air pollutant Nitrogen Dioxide (NO2) in the troposphere above the Lebanese border average from year 2018 up to August 2023 (data retained from Sentinel-5 precursor/TROPOMI Level 2 Product (in Annex 2) which revealed in the mean NO2 values across the border of Lebanon between year 2018 up to end of year 2023. It is clear that the NO2 pollution is concentrated above the Beirut area and decreases when moving east to reach its lowest value in the eastern Bekaa plain. The routine maintenance roads of Kesrouane Caza are overlain over the NO_2 map to have an idea of the ambient air quality in the surrounding area.

4.1.5 Land Use/ Land Cover

A LULC analysis was conducted to determine the distribution of LULC over the whole Caza (% of LULC distribution throughout the Caza are presented in Figure F in Annex 2). Further the analysis determined as well the % of LULC distribution along the representative road alignments with a fixed buffer of 50 m from roads centerlines (refer to Table M in Annex 2).

The assessment revealed that 29% of the Caza's LULC is comprised of outcrops. Additionally, and 24% of the adjacent LULC along Road K1.

Grasslands account for 19% of the land cover, while outcrop areas make up 7%. Additionally, dense pine forests make up 12% of the Caza's land cover, and medium to high oak forests account for 16%. The remaining land cover includes mainly urban fabrics, shrublands, deciduous fruit trees, and field crops, as specified in Annex 2.

4.2 Biological Environment

A rapid biological assessment was carried out to draw the ecological profile of the adjacent areas to Kesrouane primary roads. The assessment was based on the LULC analysis/map Results were then compiled with site visit observations. Potential flora species were also considered in this assessment and their ecological value was based on their local ecological importance (distribution of species and degree of endemism (Tohmé and Tohmé, 2014) and IUCN classification).

4.2.1 Project Settlement

The biogeographic region ranges from the Thermo-Mediterranean near the coast to the Eu-Mediterranean and Supra-Mediterranean at Wata el Joz and Mountainous zone at the level of Oyoun el Siman. The altitudinal range plays an important role in plant composition (Abi Saleh, 1996).

Thermo-Mediterranean zone comprises at the sea level a coastal belt sheltering plant communities reflecting the beach habitat and consist at higher altitude of mainly *Carob-lentiscus* series and *Quercus calliprios thermophilous* series. The Supra-Mediterranean zone is characterized by the series of *Quercus calliprinos,* the series of *Quercus infectoria;* the series of *Ostrya carpinifolia and Fraxinus ornus series; the Pinus pinea and Pinus brutia* found on sandstone. Whereas, Mediterranean mountains are characterized by different forest groupings, quite specialized floristically. Mainly cedar and fir trees are associated with varied deciduous oak trees that can also exist in scattered stand from particular subseries

4.2.2 Natural Habitats and Associated Flora

The assessment revealed that some roads involve partly particular biotopes. These biotopes include rivers, wild pine forests, oak woodlands, outcrops and rocky habitats (characterized by one of the most important floral communities, with many endemics or rare species); and riparian habitats where roads and river intersect. These ecosystems constitute a dynamic hideout for numerous reptile, mammals, and birds (detailed description of these habitats and their associated flora and fauna is presented in Table L in Annex2).

The remaining road segments are primarily adjacent to human settlements, olive groves (*Olea europaea)*, agriculture terraces and tunnels, scrublands and grasslands, cultivated trees (e.g., cypress trees), and open garrigue vegetation (discontinuous bushy associations of the Mediterranean calcareous plateaus dominated by Kermes Oak (*Quercus calliprinos*) and dwarf-shrubs). These types of habitats do not provide a favorable environment for a large variety of plants and animals.

4.2.3 Ecological Criticality

Roads that are considered ecologically critical (i.e. involve critical segments) are:

- **Roads that are bordered by particular biotopes**, such as riparian habitats (excellent refuges for birds, reptiles, and amphibians (e.g. where Road K1 and Naher el Kaleb river intersect in Kfardbiane); dense oak forests/maquis (high diversity value - e.g., bordering Roads K1 and K2); and pine forests (notably along Road K6 Daroun, and Harissa) - Pine forests offer diverse habitats, in Lebanon and Keserouane, they are frequently used in ecological restoration projects to rehabilitate degraded lands and promote ecosystem recovery.
- **Mountainous road segments,** given the ecological criticality of recorded rocky habitats and outcrops, that serve as critical breeding sites for avian predators and refuge for reptiles. They also harbor one of the most important floral communities (refer to Table L in Annex 2) . For instance, outcrops constitute 29% of Kesrouane's

LULC and 24% of the adjacent LULC along Road K1 (refer to Figure E in Annex 2).

More specifically, special care is required if routine maintenance works will take place along mountainous roads for example Road K1: 1) namely the segment in Kfardbiane, where the mix between wooded slopes, calcareous outcrops, *Quercus cerris* stands, and wet meadow is particularly significant). Calcareous rock cliffs are expected to harbour endemic and rare vegetal species typical to the mountainous area (refer to Table K) and 2) at Oyoun el Simane area of Kfardebian in the Sannine mountain (in case maintenance activities will take place at this area along Road K1). Oyoun el Simane area is known for supporting a wide range of plant and animal species including rare species typical of mountainous regions (refer to Table K). This includes the Jurd. Despite the Jurd being a 'quasi-unproductive' degraded ecosystem with low vegetation cover (arid, overgrazed, and hunting area), protecting the Jurd area and avoiding its contamination would be crucial to protect the springs in the area. These ecosystems in Lebanon require enhancement and protection.

4.3 Socio-Economic Condition

4.3.1 Summary of relevant Caza Background

General background

Kesrouane, one of Lebanon's 26 districts, spans an area of 344 km² within the country's total 10,452 km² surface. As of 2019, it was home to around 260,500 residents, comprising 5.4% of Lebanon's total population. Among these residents, 52.7% were females, and 47.3% were males, with nearly half falling within the 25–64 years' age group (CAS, 2020).

In terms of household headship, approximately 79.5% were led by men, slightly lower than the national rate of 81.5%, while 20.5% were headed by women, relatively higher than the national rate of 18.5%. The average family size is approximately 3.96 individuals (CAS, 2020).

Kesrouane experienced an overall headcount poverty rate of 15%, in contrast to Lebanon's average of 27% (UNDP, 2008). There is no updated data available concerning impoverished households and individuals with disabilities in Kesrouane. However, it is evident that the economic crisis has disproportionately affected already vulnerable groups, including persons with disabilities and those aged 65 and above (ILO, 2021).

The number of registered Syrian refugees in Kesrouane stood at 8,339 (UNHCR, 2023). They typically reside in concrete buildings within local communities. There are no official Syrian refugee's camps or tent settlements along the assessed roads (thus they are considered in this assessment as part of the local community). There is no updated data on Syrian refugees at Kesrouane level. At the national level, in 2019, 18% of Syrian households were led by women, and 6% by individuals above the age of 59. Moreover, the proportion of households with at least one member having specific needs, such as disability or chronic medical conditions, increased from 64% in 2018 to 70% in 2019 (VASyR, 2019). The vulnerability of Syrian refugees also escalated, with a growing number falling below the poverty and severe poverty lines in 2019 (VASyR, 2019).

Mitigation measures outlined in this ESMP are designed to ensure that the communities around the roads, including any vulnerable groups such as impoverished households, the elderly, and Syrian refugees, if present, will not be negatively impacted. The assessment focused on immediate sensitive receptors as specified in section 4.3.2.

Access to hospitals was relatively limited in Kesrouane, with only 18% of available services (CAS, 2020). Notable hospitals in the area include Saydet Lebanon hospital, NDU Hospital, LAU medical center, KMC hospital (located 170m away from road K5), and Bouar public hospital (located 210 m away from road K5). All encountered hospitals are listed in Table N and Table O).

Public transport accessibility was significantly lower in Kesrouane compared to the national average, being 18 percentage points less.

In terms of education, the Gross Enrolment Ratio (GER) and Net Enrolment Rate (NER) decreased with the education level. At the elementary level, Kesrouane's GER was 96.8%, and NER was 85.9%, both higher than the national rates (CAS, 2020). However, at the secondary level, the GER was 94.5%, and the NER dropped to 73.6%, again higher than the national rates at this level. Regarding illiteracy rates among residents aged 10 years and above, Kesrouane had one of the lowest rates at the Caza level (4.2%), significantly lower than the national rate of 7.4% (CAS, 2020).

Numerous schools were reported along assessed roads. They are reported in Annex 2.

Finally, in terms of income, households in Kesrouane were less likely to earn below 2,400 thousand LBP but more likely to earn 2,400 thousand LBP or more compared to the national level (CAS, 2020). The employment-to-population ratio in Kesrouane (48.5%) was higher than the national ratio (43.3%), with notable gender disparities in employment, where the ratio was 35.1% for women and 63.6% for men aged 15 years and above (CAS, 2020). Informal employment in Kesrouane was reported (CAS, 2020) to be lower than the national level (14.9% and 20.1%, respectively).

4.3.2 Sensitive Receptors

Environmental receptors

As indicated in the physical and biological analysis, specific road segments have been identified as critical due to their proximity to particular environmental features.

These environmental features/sensitive receptors include rivers, springs, as well as ecologically significant ecosystems, that require protection. In summary the main receptors are:

- Nahr El Kaleb; Nahr Ibrahim; “Wadi Tabarja”; “Wadi Ghazir”; and ‘Wadi Jounieh (refer to chapter 4 – Subsurface and Surface conditions)
- Ain ed Delbe (spring), that is located 10 m away from Road K2
- Riparian habitats near the detected rivers and when roads and river intersect (e.g. where Road K1 and Naher el Kaleb river intersect in Kfardbiane)
- Oak maquis (e.g., bordering Roads K1 and K2)
- Pine forests (notably along Road K6 Daroun, and Harissa)

- Rocky habitats and outcrops detected in Kfardibian along Road K1 (refer to chapter 4 – biological environment).

The ESMP provides a comprehensive set of mitigation measures that must be rigorously followed when conducting maintenance work in close proximity to these environmental receptors.

Additionally, some roads are deemed critical because they are situated on Karstic formations, which renders the adjacent soils (the receiving environment) highly susceptible to potential contamination. For example, particular caution is required when conducting operations along K3 that falls 100% over J6).

Social receptors

Nearly all assessed roads include segments that are in close proximity to residential buildings and shops and churches (e.g. Saydet Najet Church is 16 m away from Road K2, Christ Bible Baptist church is 4 m away from Rod K1 and Saint Elias Church is only 54 m away from Road K5, refer to Table N in Annex 2). Some roads include as well sections that are in close proximity to agricultural terraces (e.g. Road K3, K6 (in Bzumar) and K1 (in Aajaltoun, Faytroun, Faraya and Kfardibian), whereas others are in close proximity to schools (e.g. Saint Roch School is 42 m away from Road K1and Ajaltoun technical school is only 70 m away from Road K3) and hospitals (e.g. KMC hospital is located 170 m away from road K5), and Bouar public hospital (located 210m away from road K5) (refer to Table N in Annex 2).

When road sections are within a distance of 50 meters or less from, or intersect with, surrounding sensitive receptors, particular attention is required if they are to be maintained. The Contractor must inform the local community about the work schedule and execute the works at appropriate timings to avoid disruptions for main PAP (road users, residents and shop owners, citizens going to church, patients, or students) ensuring smooth access. Additionally, early coordination with owners of shops and local residents adjacent to the concerned roads is necessary before work execution. During the execution of works near agricultural terraces, water spraying would be crucial to limit impacts on farmers' produce.

Finally, it is worth noting that no sensitive receptors were recorded along Adma interchange (refer to photo 1 in Table 3-2). Road users could be affected if the project TMP was not effectively implemented.

5 Potential Impacts and Proposed Mitigation measures

In this Chapter, the project positive impacts and the identified REP's potential negative impacts are elaborated along with their correspondent mitigation measures.

5.1 Positive Impacts

Potential positive environmental impacts of the routine maintenance activities are associated with enhanced road conditions. For instance, improved drainage will 1) decrease blockages and improve surface storm water run-off, 2) improve traffic safety, and 3) control erosion, which in turn reduces the risk of water stagnation which can damage road pavement and is associated with several waterborne diseases and contamination. Additionally, the project will improve the safety conditions of the roads through repair of pavements, safety barriers and retaining walls. Most importantly, the project will create short-term employment opportunities to local residents and Syrian refugees. Considerable additional jobs will also be created in the supply chain industries as well as the engineering and consultancy services.

Finally, the project will boost as well economic activities along the active roads, for instance, shops owners will benefit from the influx of labor, and local garages will benefit from increased business in vehicle and equipment maintenance.

5.2 Negative Impacts

Potential negative impacts on local environment, communities, and workers are presented in Table 5-1. Impacts were assessed for the routine maintenance activities covered under the project scope. The grading methodology that was used is detailed in Annex 3. Critical road segments, situated on permeable formations or in close proximity to rivers/springs and areas of high ecological significance, were subjected to worst-case scenario impacts. It is expected that these road segments will experience more significant impacts, and as a result, specific mitigation measures have been provided.

Regarding the social impact assessment, impacts on socio economic conditions of vulnerable groups will be assessed as part of the impacts on the surrounding inhabited areas, as in Kesrouane, displaced Syrians are not living in specific camps, and thus are considered as part of the local communities. Moreover, it is important to mention that maintenance works in Kesrouane will not require land acquisition, therefore, vulnerable groups will not be relocated. Impacts include fugitive dust emission during maintenance work, increase in noise pollution derived from construction machinery, degradation of water quality, potential damages to existing utilities, and disturbance of local biodiversity. Potential social risks related to the project include nuisance; traffic disturbance; potential labor influx; potential social tensions; increase in GBV risks (mainly SEA and SH); inappropriate labor conditions; obstruction of temporary access routes to sensitive receptors, damages of public utilities, and others. Further, adverse HS and OHS impacts that are associated with project activities (exposure to physical, chemical, biological hazards and traffic-related accidents) are expected to be of high significance in the absence of an effective Environment Health and Safety (EHS)/OHS management system and TMP or in case of safety gaps (e.g., incomplete risk assessment and lack of safety procedures, training, engineering and administrative controls, emergency preparedness and response plan).

5.3 Environmental and Social Management Plans

All identified impacts must be controlled and mitigated as early as possible. Thus, the aim of the management plans is to ensure effective and fast action responses to achieving good environmental, social, and safety performances.

In addition to the environmental management plan (Table 5-1) and the social management plan Table 5-2), a separate OHS management plan was provided (Table 5-3).

Both the ESMP and the OHS management plan must be implemented to fulfill REP safeguard requirements. In other words, the Contractor is obliged to implement reasonable precautions to provide a safe environment for the work force and public. Measures to prevent and control occupational and community hazards are provided at this stage of the project.

However, an OHS plan, in line with CDR (2007), IFC, EHS/OHS, and OSHA guidelines for construction sites (including site-specific risk assessments), should be submitted by the Contractor before initiating works. The OHS manual plan should at least include the developed measures in Table 5-3 and a comprehensive Job Hazard Analysis (JHA). The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazard.

Finally, measures in relation to traffic management and guidance in relation to the Traffic Management Plan (TMP) that should be prepared as well by the Contractor with special considerations for Highways (to be approved by consultant before commencement of work to limit the impacts on road users and the nearby local community) are provided along with H&S control measures in Table 5-3.

Table 5-1 Environmental Management Plan

Parameter	Activities	Impacts	Significance of Impacts Before Mitigation	Mitigation Measures	Significance of Impacts After Mitigation	Responsibility
Water and soil Quality	Works with Potential to Cause Impacts in case of <u>mismanagement of generated waste</u>, <u>improper handling of construction materials</u>, and <u>uncontrolled spills and littering</u>: Pavement repair works • Excavations and milling can produce substantial amounts of dust and scattered pavement materials. • Pavement repair works will result in the generation of solid and hazardous wastes; mainly old asphalt layers, crushed sub-base aggregates, solvent and oil products etc. • Accidental spills of bituminous materials with construction runoff and storm water might result in water and soil quality deterioration. Drainage Maintenance • Improper disposal of waste of removed obstructions, debris and waste; from cleaning hydraulic structures • Improper disposal of excess waste during replacement of drainage appliances Installation/removing of road markings and paintings • Improper storage and disposal of chemical compounds (e.g., paint). • Spillage of chemical paint substances Installation of concrete barriers and concrete repair works • Spills from on-site concrete pouring	• Pollution of surface water where road cross rivers. • Pollution of underground aquifers specially that mainly all studied road alignments fall on karst limestone aquifers. • Increased water turbidity due to the generated dust that can either enter water courses when it is mixed and directed by rain or it can be deposited naturally. • Pollution of water resources and soil quality due to improper management of toxic substances (e.g., asphalt layer), inadequate disposal of solid waste, debris… • Pollution of water and soil quality due to accidental spills of bituminous materials, chemicals/paint and leachate of concrete pouring. • Pollution of water and soil quality due to improper management of the generated domestic solid waste and wastewater from the porta cabin. • Deterioration of water and soil quality due to contaminated stormwater runoff with bituminous materials, fuel/oil. More specifically, as for the groundwater resources, **nearly all roads** lie on a **<u>karstic formation</u>** characterized by **its high transmissivity** and can be easily exposed to contamination (contamination of surrounding streams leading to downstream rivers namely, “Wadi Tabarja, “Wadi Ghazir”, “Wadi Jounieh” and “El Kaleb” river).	Medium	**<u>Dust Control</u>** • During excavation, water should be sprinkled to hamper fugitive dust emissions that could pollute surrounding water quality. **<u>Construction Solid Waste and Wastewater Management</u>** • Excavated soil should be stored and transported offsite to the nearest licensed dumpsite “due to possible heavy metal contamination. • <u>During pavement repair works</u> o Cleared subgrade or reclaimed asphalt must not be disposed into the road adjacent ecosystems and rivers. o Compacted, unsuitable/degraded materials shall be disposed in a licensed landfill and suitable materials should be sent to facilities to be reused in construction. • Cleared materials and debris (soil, stones and sticks) should not be neither stored nor disposed into the nearby streams and rivers. Cleared materials should be properly collected away from drainage waterways • <u>When cleaning hydraulic structures</u>: store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain. All obstruction materials cleared debris, silt and vegetation must be disposed of to a safe place. **<u>Management of Accidental Leakages/Spills</u>** • Accidental leachate during concrete pouring should be immediately cleaned, collected in an impermeable bag and disposed along the municipal solid waste collection route. • Have a spill response plan in place and spill kits on site. All workers should be trained on its implementation. • Accidental spills of fuel or oil or hazardous materials should be stopped with an available obstacle. Spill should be cleaned with an absorbent pad or saw dust. Contaminated absorbent and/or soil should be collected in an impermeable bag to be deposed along the existing municipal waste collection route, in the absence of a national licensed landfill for hazardous waste. **<u>Proper Handling of Construction Materials and Hazardous Waste</u>** • Proper handling of fresh asphalt, slurry, paints, and other construction materials. • Provide secondary containment when storing hazardous substances in bulk quantities. • All refueling operations shall take place off-site, vehicles should be fueled up before arriving to the road section. • Ensure Material Safety Data Sheet (MSDS) of all hazardous materials (chemicals, sealants, patching materials) are present onsite. • Raw materials should be stored away from watercourses. **Additionally**, when the maintenance works are conducted in close proximity to roads that are in close proximity to critical features i.e. rivers, springs (e.g. Ain ed Delbe, 10 m away from Road K2), dense oak spot) the following should be implemented: • Clearing and grubbing should be practiced at least 30 m away from the nearest stream or river. • Avoid of use of hazardous materials (e.g. solvents, chemicals, paints...etc.) • Mix hazardous materials at a minimum of 40 meters away from any near watercourse or sensitive habitats. • Limit the application of surface treatments to the road surface and avoid over spraying near water courses and at watercourse crossings. • Maintain suitable buffers between, material storage and watercourses and sensitive habitats. • Placement of geotextile silt traps as appropriate, especially in areas close to water bodies (when roads are in close proximity to springs and rivers)	Low	Project Contractor

Parameter	Activities	Impacts	Significance of Impacts Before Mitigation	Mitigation Measures	Significance of Impacts After Mitigation	Responsibility
				• During installation of concrete barriers and concrete repair works, on-site concrete pouring must be done in a way to avoid leaching in nearby streams and water bodies. Concrete works should be performed at least 40 meters away from nearby streams or sensitive habitats. **Control of Stormwater Runoff** • In case of temporary storage of excavated materials, accidental contamination or spills of the removed soil should be avoided to limit contamination of storm water runoff and in turn the surrounding streams. • Any stockpiled construction material should be covered with an impermeable layer to avoid contamination of stormwater runoff. **Domestic Solid Waste and Wastewater Management** • Domestic-like waste shall be removed daily from the routine maintenance sites. • The generated waste onsite should be properly segregated at source into recyclables and organic waste in appropriately labelled waste bins. • The Contractor should link the porta cabin toilet to the existing wastewater network. • In case of linking the porta cabin toilet to a polyethylene storage tank, the following should be done: o A specialized contractor and licensed by the relevant authority (e.g. municipality) should be selected to periodically collect the wastewater from the polyethylene tank. o The tank should be inspected regularly to check for any leakages and to ensure that the generated wastewater is properly collected before it's full. **Timing of Works** • Clean drain structures and repair slopes and road shoulders prior to the wet season for easier control of deleterious materials and runoff. If intervention in rainy season is needed, special care is required to allow water away from the road and avoid erosion. • If the schedule requires working in the rain, the work area shall be isolated and appropriate erosion plan must be installed to prevent the release of sediment-laden water and other deleterious substances into watercourses and sensitive habitats particularly for surface maintenance activities requiring the application of patching and sealing component, tar, asphalt, and dust control materials		
Soil erosion	• Earth works • Cleaning and grubbing • Repair works resulting in disturbed areas which aren't properly re-vegetated.	• Excavation of soil may result in disturbance of soil structure and thus may cause an increase in soil erosion and release of sediments. This will permanently change the structure of the soil and surface geology. • Cleaning and grubbing grass and weeds may result-in erosion of the slopes and removal of vegetation.	Medium	• After repairing shoulders, it is important that the side slope is immediately covered with grass turfing. • When trimming of grass and weeds from roadway it is important to ensure that the grass is not grubbed but only trimmed to avoid erosion of the slopes.	Low	Project Contractor
Air quality	• Excavation and milling works • Movement of raw materials transporting vehicles on unpaved surfaces • Unloading of raw materials • Open storage of raw materials	• Exhaust emissions from vehicles transporting workers to/from site (i.e., buses, mini-vans, cars). • Exhaust emissions from power generators. • Exhaust and dust emissions from excavators, paving vehicles (graders, sweepers, dump trucks, asphalt pavers, compactors/rollers, steel wheel	High	**Control of Exhaust Emissions** • Ensure the maintenance of all construction equipment and vehicles regularly, at least once a month. • Machinery and equipment should be equipped with air pollution control equipment that should be monitored regularly to ensure its effective operation. • Power generators should be equipped air pollution control equipment. • Avoid idling time of machinery. **Control of Dust Emissions**	Low	Project Contractor

Parameter	Activities	Impacts	Significance of Impacts Before Mitigation	Mitigation Measures	Significance of Impacts After Mitigation	Responsibility
	• Disturbances to material stockpiles by local winds and material handling, which is of great significance depending on the road location. • Wind blow during transportation of materials by vehicles and specifically when transporting on unpaved roads	rollers, bitumen tanks with spreaders). • Dust emissions from disturbances to material stockpiles by local winds, material handling and traffic using unpaved roads. The generated fugitive dust will highly affect the nearby agricultural lands.		• During excavation and dust generating activities, water should be sprinkled to hamper fugitive dust emissions. In specific, water should be sprayed on exposed surfaces during dry periods near residents, schools, churches and agricultural lands surrounding the roads (refer to Table N and Table O in Annex 2). • Ensure that trucks hauling raw materials are properly covered. • Ensure that stockpiles of raw materials are always covered • Ensure that all trucks carrying removed materials/waste from construction sites are covered. **Additionally**, when the maintenance works are conducted in close proximity to critical segments (e.g. near river, natural habitat), the following should be implemented: • Loading and off-loading of raw materials should be performed away from sensitive ecosystems and/or nearby rivers. • Stockpiles of raw materials should be placed at least 50 m away from sensitive habitats.		
Odor	• Pavement repair works • Installation of road marking and painting	• Odors from asphalt fumes and paint can cause unpleasant smells to the surrounding. • Odor emissions might be generated from mismanagement of solid waste and wastewater and disrupt the local environment.	High	• Transport trucks, specifically trucks transporting asphalt, are to be tightly covered at all hauling times to reduce as much as possible release of unpleasant odors. • When maintenance activities will be performed in close proximity to sensitive receptors (refer to Table N and Table O in Annex 2), the community should be informed beforehand regarding the expected odor emissions. • Ensure daily collection of solid waste from the site and adequate management of the generated wastewater.	Low	Project Contractor
Noise	• Elevated noise levels will mainly result from excavation, pavement and milling, and concrete placement, etc. • Noise and vibration might be caused by the operation of earth moving and excavation equipment, concrete mixers, cranes and the transportation of equipment, materials and workers.	• Heavy and noisy machinery such as, excavators, bob cat, steel roller, compressors, pick- up, dump trucks that generate unpleasant noise levels and disrupt nearby settlements and natural habitats.	Medium	• Regular maintenance of the machinery, equipment and vehicle should be performed to prevent excessive noise. • Appropriate work schedule should be applied to avoid nuisance to the surrounding receptors. • Vehicles and equipment that meet national standards for noise and vibration should be used. • Avoid noise generating activities near roads surrounded by sensitive receptors (mainly road segments that are surrounded by forests)	Low	Project Contractor
Biodiversity	• Routine maintenance debris, excavated materials and other used construction materials if discharged directly into the adjacent rivers and valleys. • Wastewater discharge into the roadside woodlots and riparian habitats can severely affect the local fauna and flora and eventually lead to population destruction. • Contamination of terrestrial habitat due to accidental spill • The generation of emissions and disturbances such as noise, dust, and pollutants in adjacent areas' soil and vegetation. • Clearing and grubbing (i.e., removal within the limits of	• Temporary disturbance of nearby ecosystems • Direct destruction of population • Habitat Alteration • Road kills (i.e., mortality due to vehicular collisions). • Contamination of terrestrial habitat due to accidental spills • Fauna injuries due to collision with machine	Medium	**General Mitigation Measures** • During drainage maintenance, culverts should be surveyed for the presence of nesting communities • Culverts where wildlife have been determined to be absent do not require buffers or exclusion practices • Prior to grubbing or excavation, the contractor should inspect the working zones for areas of endangered plant or animal species, any findings shall be reported immediately • Whenever any vegetation is scheduled to remain in-place, selective clearing techniques shall be employed. All vegetation listed to remain should be marked • Contractor's personnel should not damage remaining shrubs, trees or their root systems during selective clearing • A waste management plan must be taken to avoid contaminating adjacent natural habitats and direct destruction of wildlife **Strict Measures Near Critical Habitats:** • In case works will take place near riparian habitats (i.e., when roads cross or are in close proximity to rivers and streams) provide a filter strip between the road and the river/stream (e.g., Wadi Tabarja, "Wadi Ghazir", "Wadi Jounieh" and "El Kaleb" river...etc.). • Prevent spillage of construction materials and do not discharge unused or removed materials during maintenance activities into adjacent natural habitats (refer to critical natural habitats in Table M in Annex 2).	Low	Project contractor

Parameter	Activities	Impacts	Significance of Impacts Before Mitigation	Mitigation Measures	Significance of Impacts After Mitigation	Responsibility
	working area all vegetation, surface debris and scattered stones and rocks etc.) could include accidental removal of sensitive and protected species. • Fauna injuries due to collision with machine and vehicles due to increase in traffic movement			• Restricting the use of noisy machines and/or adopting noise-reducing means (silencers) for construction machines, especially near sensitive areas • Washing of vehicles and machinery should be done offsite and away from particular biotopes (wooded lands and riparian ecosystems); • In case works will take place along mountainous roads that involve rocky habitats (at higher elevation, e.g., K1) avoid direct destruction of reptile communities by creating a buffer zone. • Road cross-section must be fixed during works to reduce the impact on biodiversity, for example, by flattening side slopes. This makes crossing easier for animals that find roads a physical barrier (WB)- If feasible (in case major maintenance activities will take place at roads involving critical natural habitats e.g. segments of road bordering pine forests, oak maquis and rocky habitats.		
Resources Consumption	• Water will be used for domestic purposes, for construction activities (curing of concrete, moisturizing temporary stockpiles…etc.) and for cleaning and dust suppression. • Energy will be consumed for the operation of vehicles and equipment.	• During the routine maintenance works, overconsumption of water and energy will lead to exploitation of natural resources.	Medium	**Control of Freshwater Demand** • Dry clean-up methods should replace wet cleaning methods whenever practical (sweeping, dust collection vacuum, wiping…etc.). • Appropriate plastic sheeting or waterproof paper should be used to cover the concrete after water curing to preserve moisture and reduce the evaporation that leads to decrease water quantities used. • Signs near water-using appliances should be installed to encourage water conservation. **Control of Energy Demand** • Turning off non-used equipment should be done. • Machinery and generators shall be regularly maintained and operated in an efficient manner. • Vehicles should not be allowed to remain idle for long periods.	Low	Project Contractor

Table 5-2 **Social Management Plan**

Parameter	Activities	Impacts	Significance of Impacts before Mitigation	Mitigation measures	Significance of Impacts After Mitigation	Responsibility
Social Risks	**All project activities**	**Socio-Economic Conditions Community** • Potential Labor influx • Labor-induced SH and SEA • Traffic disturbance and obstruction of access routes to sensitive receptors • Disturbance of sensitive receptors • Disturbance of public utilities and interference with private properties/lands	High	**Potential Labor influx and labor induced SEA/SH** • Providing workers with the necessary training and awareness raising session on issues regarding SEA/SH, GBV prior to signing the CoC. • Ensuring that workers sign the Code of Conduct (CoC) (refer to Annex 5) that targets GBV risks, specifically SEA induced by labor influx, and penalizes the perpetrators of SEA/SH. • Ensuring that REP established GRM is well disseminated to affected communities (before commencement of works) through municipalities public boards, project sign boards, and mobile GRM signs. • Ensuring that REP GRM (including the QR code along active roads) is properly functioning to record complaints from the surrounding communities. This will ensure the management of complaints and the implementation of corrective actions. • Ensuring that training on GBV/SEA are regularly delivered, and REP GRM and the referral pathways are functioning. • REP GRM specific procedures for SEA/SH, including confidential reporting with safe and ethical documenting of SEA/SH cases must be communicated to all workers. • The Contractor should employ a social/environmental specialist to supervise the GBV issues related to SEA/SH such as supervise signing of CoCs, verify adequate operation of the GRM for SEA/SH etc. **Obstruction of access routes to sensitive receptors** • Adequate and timely communication with the concerned municipalities and dissemination of project-related work schedule with the surrounding community.	Low	Project Contractor

Parameter	Activities	Impacts	Significance of Impacts before Mitigation	Mitigation measures	Significance of Impacts After Mitigation	Responsibility
				• Routine maintenance works should not be performed during peak traffic hours (e.g., works can take place when students are already at school and in a way not to disturb people going to church where roads are in close proximity to schools, churches and other sensitive receptors as shown in Annex2). • The temporary traffic control can involve lane width reduction, lane closures depending on the type and duration of routine maintenance activities to be performed. Detours and diversions should be designed and provided as needed to ensure a continuous traffic movement. Traffic control measures will be provided in the project TMP. • Provision of safe passages and crossings for pedestrians namely for roads that involve schools, hospitals, and churches (refer to sensitive receptor map and table in Annex 2) and for farmers when road segment are in close proximity to agricultural lands (refer to LULC map). **Disturbance of sensitive receptors (noise and dust)** • Noise levels and air emissions should be maintained within the national permissible limits and the contractor should be limited to working hours as defined with local municipalities. • Activities should be planned in consultation with the local community so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. • Nighttime activities, if any, should be performed using low-noise technologies. • When performing noise generating activities, the Contractor should inform sensitive receptors such as nearby residences, schools, hospitals, and churches, if they lie in close proximity to the assessed roads, as shown in Table N in Annex 2). • During excavation and dust generating activities, water should be sprinkled to hamper fugitive dust emissions. In specific, water should be sprayed on exposed surfaces during dry periods near schools, churches, and agricultural lands surrounding the roads. • Strict supervision must be applied when roads are in close proximity to the detected sensitive receptors i.e. ensuring that the Contractor will apply the above provided strict measures and that ongoing communication with affected people is being conducted. **Disturbance of public utilities and private properties** • Pushing excavated materials onto adjacent lands and damaging public utilities or private properties must be avoided through delineation of work areas. • When trimming trees, broken or cut limbs are not to fall on or damage overhead wires. • Avoid damaging any possible existing infrastructure and try to obtain plans prior to commencement of any maintenance works in coordination with the relevant municipalities. • 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		
	All Project activities and the recruitment process	**Labor Conditions** • Inadequate labor conditions • Workers tension (Syrian/Lebanese ratio) • Child labor • Under-participation of women	Medium	**Child Labor** • The project should have measures in contracts to ensure that those below the working age are not hired and ensure that labor law of Lebanon is followed. • Labor registry and age verification must be maintained during the whole project through an age verification mechanism to be implemented by the Contractor with documentation and records to be checked by the supervising engineer (including the continuous ID control). • Penalty provisions should be available for hiring child labor. • During the employment procedure, the contractor or subcontractor should abide by the Lebanese Law No.0 dated 1946. **Inadequate Labor Conditions** • Safety and protection of workers should be ensured within the contracts provided by the contractor. • Appropriate rules and regulations should be implemented in order to ensure the protection of laborers. • Contractors should be forced to abide by the specified Lebanese law determining the minimum	Low	Project Contractor

Parameter	Activities	Impacts	Significance of Impacts before Mitigation	Mitigation measures	Significance of Impacts After Mitigation	Responsibility
				wage and minimum working age for children. • Contractor must comply with Decision 29/1 dated 2018 which restricts significant number of jobs to Lebanese only and allows Syrians to occupy jobs that are not restricted to Lebanese. • Continuous monitoring is required to maintain adequate labor conditions. • Ensure that all workers (locals and foreign, skilled and unskilled) shall be compensated and are contracted equally as per the scale of market price rates, have equal contractual benefits and working conditions, and have access to internal GRM **Social tensions and conflict over job-sharing and dissatisfaction with allocation of project-generated jobs.** • Clear criteria for job selection and allocation should be adopted accounting for the ratio of Syrian and Lebanese community workers in Kerouane Caza and types of positions available. • It is important to avoid competition between Syrian workforce willing to accept lower wages and skilled Lebanese labor. • The Contractor should ensure a fair allocation of job opportunities, and most importantly non-discrimination and fair treatment should be ensured among workers (such as equal contractual wages/benefits and working conditions). • Clear communication with all affected workers and good implementation of REP GRM are essential to mitigate the potential risk of social tensions or dissatisfaction among Syrian and Lebanese workers. **Under-participation or underemployment or discrimination of women** • Setting minimum percentage of women at the employment phase. • The project should ensure that gender equality is attained when it comes to recruitment, salary levels and others. • Promoting the employment of females in appropriate jobs such as managerial or administrative positions.		
Physical Cultural Resources	• **Excavation, milling and grubbing.**	• **During excavation (shallow and deep) and other geotechnical works, there is a potential to unexpectedly find and impact archaeological materials in an area not previously known for its archaeological interest.**	Medium	Prior to grubbing or excavation, the contractor should inspect the working zones for areas of archaeological remains. Chance-find procedure: • All maintenance activities in place of the discovery must cease immediately once discovery of an archaeological artefact or complex is discovered. • The site must be fenced (protected) and authorities (Ministry of Culture / Directorate General of Antiquities (MoC/DGA)) must be informed within 24 hours following the national procedures (law 166/LR of 1933 that regulates antiquities and law 37 of 2008 on Cultural properties • The area should be secured in order to prevent any destruction or disappearance of the archaeological complexes. • Work should not be commenced without the DGAs' written decision on how to handle the findings and recommence the work.	Low	Project Contractor

Table 5-3 H&S Management Plan (in accordance with IFC EHS/OHS guidelines) – *see more details in Annex 7*

Health and Safety Hazards	Activities	Impact	Significance of Impacts before mitigation measures	Mitigation Measures	Significance of Impacts after mitigation measures	Responsibility
Community Health and Safety	• All activities	• General site hazards • Disease Occurrence • Traffic accidents	High	**Communication of risk with local community** • Placing of warning signs to warn the passing citizens about the potential hazards. Signage should be in accordance with international standards (e.g., OSHA 29 CFR 1910.145) and be well known to, and easily understood by the general public as appropriate. • Restricting access to working sites, through directorial controls and dangerous spots in the working sites such as pits, trenches, etc. must be clearly marked and fenced. **Disease prevention** • When repairing rain cuts and minor slips, if material was borrowed along the sides of the embankment, it is important to ensure that it does not become a pond of stagnant water where mosquitos can breed, particularly when it is situated nearby human settlements **Developing a TMP** • A TMP must be prepared by the Contractor and approved by the Consultant and PIU before commencement of work to ensure traffic safety (refer to traffic safety section of this table) • The TMP should address the partial closure requirements to limit interference to the traveling public and minimize project-related traffic delay and accidents by applying effective traffic mitigation plans and timely diffusion of information to the community and motorists concerning construction operations. These plans must cover alternative routes when needed and must focus on preventing, minimizing and managing traffic incidents. • The TMP shall be approved by the Consultant prior the execution of work. • A special TMP for highways must be prepared as well and approved by the Consultant, where it is advised to favor non-peak hours. • In case of accidents In case of accidents, the CDR needs to be made aware of the incident within 24 hours of its occurrence, and the Bank within 48 hours	Low	Project Contractor
Occupational Health and Safety	• All activities	• **Job Hazards** • **Workplace/Site Hazards** • **Injuries** • **Physical hazards** (covering all planned routine maintenance activities) o Noise o Lifting, slipping, electrical, equipment and working at height hazards o Vibration and excavation hazards o Vehicle driving & site traffic hazard o Environmental hazards o Culvert–specific hazards • Confined space • Hazardous atmosphere • Culvert collapse • Water: High flow rates can create dangerous footing conditions • Animals, particularly snakes, in the culvert can be dangerous, especially if trapped • Entrapment: Deep mud can entrap personnel walking through it	High	**Hazard Identification and Risk Assessment** • A JHA must be conducted before commencement of work. The results of the analysis should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards. • Permit to Work (PTW) should be used for Higher Risk activities. **Workplace** • Clean eating area, potable water supply, lavatories and showers, first aid kits, lighting, fire detectors and fire-fighting equipment must be provided by the Contractor Kesrouane site office. • Equipment should be adequate for the dimension of the office and the maximum number of people present. • Fire and emergency alarm systems must be installed. • A person must be appointed to be responsible for the fire protection. • Workstations must be equipped with first-aid stations, rest areas, and eye-wash stations • Fire extinguishers must be available in foremen cars. **First Aid and Injuries** • The Contractor should ensure that qualified first-aid can be provided at all times. • First aid kits must be available at project site office and at foremen cars. • One laborer onsite should be appointed to respond to emergency cases. • All workers onsite should know where the first aid facilities are located and how to adequately use first aid kits. • A complete list of nearby hospitals, medical centers and emergency contact numbers should be provided to workers at project site offices and to foremen. • In case of any severe incidents/accident, immediate reporting to CDR within 24 hours of their occurrence, and the bank with 48 hours must be done Special care must be taken: • If manual methods for removing brush, and other vegetation are labor-intensive and require close supervision to ensure good production and worker safety. • In order to avoid serious physical injury or equipment damage when debris being cut by a machine shatters and flies in unpredictable directions. **Communication of Hazard**	Low	Project Contractor

Health and Safety Hazards	Activities	Impact	Significance of Impacts before mitigation measures	Mitigation Measures	Significance of Impacts after mitigation measures	Responsibility
		○ Working with precast concrete elements -specific hazards • Incorrect loading and unloading methods: High-risk activity (serious injuries) • Uncontrolled collapse of elements • Incorrect lifting and/or unsafe lifting equipment • Poorly secured loads • Inappropriate or unstable work areas for cranes • **Chemical hazards** ○ Exposure to toxic, corrosive, sensitizing or oxidative substances. ○ Exposure to asphalt fumes is linked to breathing problems, and skin irritation (Norseth et al, 1991). • **Biological hazards** ○ Covid-19 spread/ labor-intensive project		*Area signage and labelling of equipment* • Hazardous areas (e.g., storage and excavation areas), installations, materials, and emergency exit, etc. must be marked appropriately. • All containers that may contain substances that are hazardous must be labeled as to the contents and hazard (i.e., based on MSDS), or suitably color coded. Copies of the hazard coding system must be posted outside the storage area where they are likely to come to the attention of safety personnel. • All energized electrical devices and lines should be marked with warning signs. • Machines with moving parts must be turned off, all electrical devices must be marked with warning signs. • Warning signs (danger/caution signs, general safety information signs, emergency and direction signs) must be installed at sites, offices, parking/storage areas as needed. *Site security* • Communication of risks to workers must be implemented. • Signage should be easily understood by workers. • Good house-keeping practices (e.g., placing loose construction materials in established areas and properly managing generated wastes) **Training** • Ensure that all workers are given proper site-specific instructions on OHS prior to commencing work. The OHS training should consist of hazard awareness and control measures. • Provide specialized trainings for supervisors of High-Risk activities to enhance personal safety (e.g., for people working at height, supervisor must be assigned and trained on risk assessment, inspection of scaffolds according to CFR 29 OSHA Part 1926 standards (SCF) and for basic fall arrest and basic rescue). • Trainings on PTW must be conducted to all workers participating in the job. • First Aid Training must be delivered to workers by a certified trainer from Red Cross to help them learn to be more conscious of safety on site and how to deal with accidents occurrence in a proper way. **Physical hazards** Noise • Workers should not be exposed to a noise level greater than 85 dB (A) for a duration of more than 8 hours per day without hearing protection. • Limiting the duration of noise exposure (e.g., for every 3 dB (A) increase in sound levels, the allowed exposure period should be reduced by 50 percent). reference • Periodic medical hearing checks should be performed on workers who are exposed to high noise levels. Working at Height • Working at height: Scaffolds inspection according to the OSHA standards • Fall prevention and protection measures should be implemented, such as the installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area • Train supervisors and workers for basic fall rescue Safe tree branches removal • Ensure all ladders or scaffolding used in tree branch removal are securely fixed and one worker is holding the ladder while another worker is climbing up and cutting the branches. • When using the rope to remove branches from tree, ensure that the length of the rope is longer than the height of the tree. Electrical, lifting, slipping, and equipment hazards • Checking all electrical cords, cables and hand power tools for frayed and exposed cords and following manufacture recommendations for maximum permitted operational voltage. • Protecting power cords and extensions from physical damages like getting wet from rain. • Train all workers on proper safe lifting technique (namely for lifting concrete elements).		

Health and Safety Hazards	Activities	Impact	Significance of Impacts before mitigation measures	Mitigation Measures	Significance of Impacts after mitigation measures	Responsibility
				• Assess thoroughly the work area in order to identify areas at high risk for slip, trip, and fall injuries and control it; conduct regular inspections on general cleanliness, spill response, and the effectiveness of cleanings; • Turning off or disconnecting machinery with exposed moving parts. Working with precast concrete – specific hazards (OSHA standards) • The lifting hardware must be capable of supporting at least 5 times the maximum intended load • No employee shall be permitted under precast concrete elements being lifted • Use of tag lines to eliminate potentially hazardous situation Exposure to vibration • Installation of vibration dampening pads or devices. • Limiting the duration of exposure. Exposure levels should be checked on the basis of daily exposure time and data provided by equipment manufacturers. Excavation hazards (IFC OHS guidelines): • Controlling site-specific features which may contribute to excavation slope instability (e.g., use of excavation dewatering, side-walls support, and slope gradient adjustments that minimize the risk of collapse and entrapment). • Providing safe means of access and egress from excavations, such as graded slopes, or ladders. Vehicle driving and site traffic hazards (IFC OHS guidelines): • Training and licensing vehicle operators in the safe operation of specific vehicles • Ensuring drivers undergo medical surveillance (regular request of medical checkup reports including drug test for truck and heavy machinery drivers). • Establishing rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures, and control of traffic patterns. • Implementation of traffic control procedures (e.g., application of traffic control devices and assigned traffic control people). • Traffic control procedures must be communicated to workers prior to starting work and used for toolbox safety meetings. Environmental Hazards • Care should be taken when cleaning culverts because snakes can be present. • Workers when undertaking routine maintenance activities (e.g., clearing and grubbing) can be exposed to bite and stings. Culvert-specific hazards • Permit-required confined space entry procedures (as specified in OSHA CFR 1910.146) should be followed for culverts. These procedures include: o Workers shall be trained in confined space entry procedures. o Entry hazards shall be evaluated and workers shall be informed of these hazards. o Before and during culvert entry, the atmosphere should be tested for oxygen content and flammable gases. o At least one assistant should be available outside the permit space into which entry is approved for the duration of entry operations. o Forced ventilation should be supplied if needed. **Chemical hazard** • All workers should be responsible for understanding the MSDS for any chemical that they may be exposed at the construction site (toxic, corrosive, sensitizing or oxidative substances). • All workers should handle hazardous materials properly, clean up any spills that occur. • All workers must wear proper PPE at all times. Hazard associated with working with Asphalt • The application temperature of heated asphalt must be kept as low as possible.		

Health and Safety Hazards	Activities	Impact	Significance of Impacts before mitigation measures	Mitigation Measures	Significance of Impacts after mitigation measures	Responsibility
				• Worker exposure to asphalt fumes and asphalt-based paint aerosols must be minimized. • Recommended PPE when working with asphalt are respiratory protection/ chemical goggles, loose clothing with closed collars and buttoned cuffs, thermally insulated gloves with gauntlets that extend up the arm, safety shoes at least 150 mm high and laced. • Long handled sprayers with flexible hoses should be used when emulsified asphalts are applied by hand for tack coats. Hazardous materials plan • The containers of hazardous substances shall be placed in a leak-proof container to prevent spillage and leaking (e.g., banded-container). Secondary containment system must be free of cracks and able to contain the spill. • Any leaking containers must be removed immediately from the site and appropriate remediation measures must be undertaken on resulting contaminated areas. • Chemicals should be managed, used and disposed, and precautionary measures taken as required MSDS. • Workers who may be in contact with such products must be trained on their handling and toxicity. • Hazardous material containers must be kept in designated storage areas. **Biological Hazards** Covid-19 measures • Specific posters, signs and kits in relation to Covid-19 must be available at offices and working zones. • All workers should keep proper spacing of at least 1.5 m. • All workers should wash their hands often and clean them with an alcohol-based hand sanitizer that contains 60 to 95% alcohol • All workers should wear a facemask at all times. • All workers should cover their mouth and nose with a tissue when they cough or sneeze. • All workers should avoid sharing personal items. **PPE** • Selection of PPE should be based on the hazard and risk ranking. • Correct use of PPE should be part of the OHS training program for employees. • Ensure that workers wear PPEs all the time during working hours. • Specific PPE should be used when handling corrosive or poisonous substances and working with asphalt (NIOSH, 2003) including thermally-insulated gloves to keep asphalt from burning or irritating the skin; steel-toed safety shoes; a face shield with the safety glasses. • Ensure proper maintenance of PPE, including replacement when damaged.		
Traffic Safety: Community and Workers (in accordance with CDR/WB guidelines on TMP)	• All activities that will affect traffic movement • Transportation of raw materials	• Increase in movement of heavy vehicles for the transport of construction materials and equipment may increase the risk of traffic-related accidents and injuries to workers and local communities.	High	**Community** • Signs, barriers and traffic diversions signs (vertical signalization and signs at the beginning of work zone) should be placed prior the working zone to inform the public that routine maintenance activities are taking place. • Protection screens should be mounted on the concrete barriers delineating the work zone boundaries to avoid the drivers' distraction with the routine maintenance activities, to reduce the dust and noise resulting from these activities and prevent anyone from entering the work site. • Advanced warning and regulatory signs should be installed prior and along the work zone. The signs should be placed at decision-making points on routes approaching the construction site and detour to inform motorists about alternate routes to avoid the constructions works. • Advisory speed limit signs should be placed in advance or the reduced speed zone to inform the drivers about any driving speed changes. • Installation of signs to ensure access to nearby facilities. • Pedestrian safety must be ensured namely children if the school is in the vicinity. • Traffic should be allowed only in the lane not being sealed. Car must go in a direction opposite of the seal coat operation. This prevents cars being turned on freshly placed seal coat. Some emulsions may require up to 24 hours of traffic control or until the first sweeping occurs. • Temporary traffic control schemes must be removed after completion of the construction activities that can mislead the drivers.	Low	Project Contractor

Health and Safety Hazards	Activities	Impact	Significance of Impacts before mitigation measures	Mitigation Measures	Significance of Impacts after mitigation measures	Responsibility
				Workers • Regular traffic safety training sessions must be delivered to workers. • Safe movement and working environment for workers must be provided (e.g. temporary traffic barriers should delimitate the work zones to protect the workers from any errant vehicle). The concrete barriers should be flared to the clear zone outer edge to avoid any vehicle head-on collision with the upstream barrier. • Entrance and exit gates should be provided to allow the access of workers, trucks and other construction equipment.		
Road users and Nearby communities	• All routine maintenance activities on highway • Repair of existing expansion joints	• Routine Maintenance on highway and the repair of expansion joints	High	• **The traffic management plan shall be implemented, as first stage before starting works.** • **During the execution of maintenance works including the repair of joints, the traffic shall be diverted to the edge lanes or to service lanes in a safe manner, ensuring the continuity of traffic circulation with an acceptable flow** o **If joints will be repaired during daytime, the implementation of traffic management plan will divert the traffic to the edge lanes or to a service lane since traffic flow is low.** o **If joints will be repaired during night time, although traffic volume is low at night, the TMP will include measures to alert road users of any detours or diversions in a clear visible manner.**	Low	Project Contractor

6 Environmental and Social Monitoring Plans

Monitoring aims to ensure that all project activities undertaken are environmentally and socially sound, while considering the mitigation measures provided in this ESMP. It does so by defining a clear set of measurable indicators in an attempt to properly evaluate the project's performance and compliance with WB safeguards. These indicators can then be used to assist in the early detection of non-compliances. This allows the involved parties to take corrective measures and limit any unsatisfactory performance if such a case arises. It also allows them to accurately communicate the performance and compliance of the project with REP proponents.

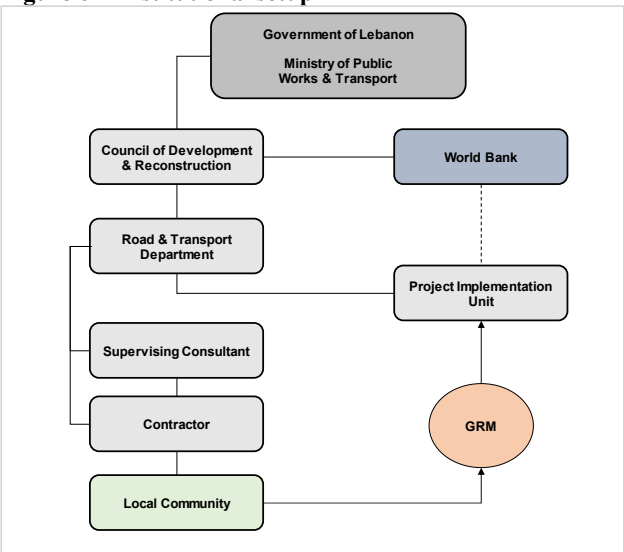
6.1 Institutional Setup

During the routine maintenance work, the Contractor would be the primary actor; ensuring compliance of works with the different items specified in the management plans. Accordingly, the Contractor will be supervised by several entities appointed by CDR (executor of REP on behalf of MoWPT) through weekly and/or monthly reports (sent by the Contractor) and site visits, ensuring and enforcing mitigation measures. In order to achieve proper management and monitoring, a clear, functional institutional structure was defined (refer to figure below).

The project will be monitored by CDR Project Implementation Unit (PIU) dedicated to REP, which includes social, environmental and H&S specialists through the assigned Supervising Consultant who will directly oversee the Contractor and report to the PIU.

PIU will be responsible for providing the overall plan direction and validation of management plans and monitoring of compliance and progress reporting to the WB. The responsibility of implementation and management of environmental and social safeguards by the PIU will be coupled with the assignment of Supervising Consultant who will be in charge of ensuring sound application of the ESMP. Accordingly, in practice, the Supervising Consultant will have to appoint qualified experts to directly supervise and guide the Contractor team and ensure project compliance. Finally, the main concerned municipalities will be involved in managing and communicating citizen's potential complaints to the CDR (PIU).

Figure 6-1 Institutional setup



6.2 Capacity Building

In order to ensure safeguard procedures, instruments and monitoring needs of REP are well understood by the Contractor staff, CDR (i.e. Supervising Consultant) will ensure that skilled and unskilled workers receive trainings covering environmental; social (including SEA, CAE, GBV, GRM, CoC), and OHS/First aid issues/requirements before initiation of works. These trainings aim to familiarize the Contractor's staff on REP safeguards management and monitoring requirements as specified in this ESMP. Further, refreshers and specialized training sessions must be conducted at all times during the implementation of the project.

In practice, before commencement of work, the Contractor must develop a tailored training / capacity-building plan on Environmental, Social and OHS issues that aligns with the planned specific maintenance works and road location. Accordingly, the plan, agenda and training materials need to be submitted to the Supervisor Engineer for review and approval.

6.3 Monitoring Plans Implementation

Contractors' experts and officers and the Supervising Consultant's safeguard expert will monitor the developed key indicators to ensure the implementation of this ESMP. Compliance monitoring involves visual observation/inspection, interviews with employees and external stakeholders, measurements and inspection of equipment, document review, and assessment of activities and parameters (Table 6-1). This will allow detecting, reporting, and correcting the non-compliances. More specifically, the Supervisor Consultant must ensure that (1) Contractor staff are receiving safeguard trainings and signing CoC, (2) Contractor is filling out (a) workers' registration and muster roll sheets; (b) complaints, and (c) environmental & OHS forms (e.g., incident forms, waste log, traffic inspection checklists, training records, equipment inspection checklists etc.) which shall be reported in the monthly progress report (3) Contractor is not hiring underage labors (age verification mechanism-regular inspection of workers IDs). The Supervising Consultant must also inform CDR/WB on any severe accident on-site. Finally, ministries (e.g., MoE, MoA, MoC/DGA etc.) would also be expected to follow up, if deemed necessary, on the proper implementation and abidance by the relevant laws and regulations.

Table 6-1 Environmental, Social, and H&S Monitoring Plans

Impact	Parameters to Monitor	Frequency	Monitoring Location	Monitoring Method	Standard/Guidelines National/International	Monitoring Responsibility	Institutional Follow-up	Approximate Cost (USD/year)
Environmental Monitoring Plan								
Air Emissions/GHG/ Dust	PM2.5-10, SO_x, NOx, O_3, CO,Total Suspended Particles (TSP)	Measurement (upon complains Visual (weekly)	• Construction vehicles exhaust • Working sites for dust	• Single point sampling (at one quarter the diameter across the stack/source) • Visual opacity • Smoke inspection	Decision 16/1 dated 2022 Particulate Matter ($PM_{<10}$) 50 mg/Nm^3 Sulfur dioxide (SO_2) 10 mg/Nm^3 Nitrogen dioxide (NO_2) 2,000 mg/Nm^3	Supervising Consultant	CDR (PIU)	(1,500 per test)
Noise	Noise Levels (Lmin, Lmax, and Leq)	Continuous during the execution of noisy operation (measurements to be conducted upon complains)	• At the working site, especially near loud machinery and excavation sites • Near sensitive receptors	• One sample per location (near sensitive receptors)	Decision 52/1 dated 1996 and international standards when more stringent (refer to section 2.3)	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
WW Generation	Domestic-like wastewater	Monthly	• Polyethylene storage tank (in case porta cabin toilet is not linked to WW network)	• Visual inspection ensuring no leaks from tank	Lebanese and International standards (refer to section 2.3)	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
Accidental Releases	Number of spills/leaks (of lubricants, oil, fuel, or other chemicals)	Continuously-during the execution of maintenance activities	• Around the Routine maintenance site, especially near equipment, material, and storage tanks	• Visual inspection	N.A.	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
Solid Waste storage, transport, and disposal	Collection and transport of the generated waste to the designated site.	Continuously-during the execution of maintenance activities	• Solid Waste Collection Point • Storage areas • Transport trucks	• Visual inspection • Review of solid waste log	N.A.	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
Biodiversity Monitoring								
Biological Resources	Ecological audit for particular biotopes	When maintenance activities will occur near critical natural habitats	• Riparian habitats near water channels and streams • Forests and rocky habitats adjacent to the roads	• Samples and photos per location and GPS point	N.A.	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
Social Monitoring Plan								
SEA/SH	• CoC signed by new workers • Delivery of induction training (including GBV)	Before commencement of works or every time a new worker is recruited	• At site office	• Signed CoC • Number of workers trained • Training attendance sheet • Interview with workers • Review of received GBV-related grievance	N.A.	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
	• GBV-related internal grievances	Upon grievance occurrence	• At routine maintenance site	• Received complaints and GRM records	N.A.	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
Social Tensions and Conflicts over Job-Sharing	• Number of related grievances • Percentage of workers (based on gender, nationality)	Continuously-during the execution of maintenance activities	• At routine maintenance site	• Received complaints and records • Check workers 'sheets	N.A.	Supervising Consultant	CDR (PIU)	-
Obstructing Access to Amenities	• Type, location, and duration of amenity to which access was obstructed	Before and during the execution of maintenance activities	• At routine maintenance site	• Visual inspection • Complaint records	N.A.	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
Working conditions	• Labor's wages and working hours	Monthly	• Laborers' contracts	• Review workers' complaints records	Lebanese Labor Law dated 1946	Supervising Consultant	CDR (PIU)	-

Impact	Parameters to Monitor	Frequency	Monitoring Location	Monitoring Method	Standard/Guidelines National/International	Monitoring Responsibility	Institutional Follow-up	Approximate Cost (USD/year)
	• GRM in place • Grievances recorded			• Interview with workers • Labor law verification				
Child labor	• Labor's age	Continuously-during the execution of maintenance activities	• At routine maintenance site	• Labor registry • Government-issued IDs and Badges (age verification)	Lebanese Labor Law dated 1946	Supervising Consultant	CDR (PIU)	-
Underemployment of Women	• Percentage of female employees in workforce	Monthly	• At site office	• Labor registry	N.A.	Supervising Consultant	CDR (PIU)	-
Other Grievances	• Internal and external grievance reports	Upon grievance occurrence	• At each routine maintenance site	• Complaints records	N.A.	Supervising Consultant	CDR (PIU)	Included in Routine maintenance Cost
Safety monitoring Plan								
OHS	• Regular OHS- training-OHS – verifying training logs (covering all OHS matters) • Total number of work injuries • Recorded incidents including near misses • Availability of safety barriers along the concerned road segment • Availability of OHS procedures onsite (JHA, work permits...etc.) • Presence of qualified OHS officer and foremen onsite • Ensure use of PPE • Availability of fire extinguishers onsite • Good housekeeping onsite • OHS-related internal grievances recorded • Covid-19 precaution measures in place • Traffic violations and accidents recorded (number of accidents)	Continuously-during the execution of maintenance activities Continuously-during the execution of maintenance activities	• At routine maintenance site • At routine maintenance site office	• Attendance sheet • Employee records • OHS incident form • Review of OHS records (inspection reports, follow-up reports, incidents, and training records) • Review of covid-19 checklist (reported cases) • Inspection of driving license, drivers' medical checkup reports, and drug tests • Review of traffic inspection checklists	N.A. WBG OHS guidelines for construction sites CDR OHS guidelines OHS national laws/decree Lebanese Traffic Law 243 dated 2012 (licenses requirements) MoPH guidelines/measures in relation covid-19	Supervising Consultant Supervising Consultant	CDR (PIU) CDR (PIU)	Included in Routine maintenance Cost Included in Routine maintenance Cost
Traffic Hazards	• Safe traffic flow on roads under maintenance in accordance with TMP • Availability of adequate safety and warning signs and restricted access measures • Availability of Flagmen • Availability of appropriate safety barriers • Availability of TMP onsite, where (fully implemented)	Continuously-during the execution of maintenance activities	• At routine maintenance site	• Visual inspection	N.A.	Supervising Consultant	CDR (PIU0	Included in Routine maintenance Cost

Impact	Parameters to Monitor	Frequency	Monitoring Location	Monitoring Method	Standard/Guidelines National/International	Monitoring Responsibility	Institutional Follow-up	Approximate Cost (USD/year)
	• Availability of qualified Traffic Safety officer onsite, • Availability of logs and records of traffic incidents...etc.							
Other Impacts – Monitoring								
Damage to existing infrastructure	• Type, size, and number of damaged infrastructure entities	Continuously-during the execution of maintenance activities	• At routine maintenance site	• Visual inspection	N.A.	Supervising Consultant	CDR (PIU)	-
Risk on cultural resources	• Possible archaeological features found during the works • Adequate implementation of the archeological chance find procedure.	Upon discovery	• At routine maintenance site	• ID and photographic records of all archaeological features found during the works	Lebanese Antiquity Law No. 166	Supervising Consultant	DGA	-

6.4 Documentation and Reporting

Monitoring yields lots of data regarding project performance. As a result, proper documentation is necessary for two reasons: first to prepare and send performance reports to the concerned parties and second to analyze the acquired data and implement changes when necessary. In this context, monitoring reports will take place as described below.

- Contractor's experts submit compliance reports to the Supervising Consultant on a monthly basis including completed workers' sheets, GRM log, and environmental and OHS forms - these forms should encompass a wide range of information, including but not limited to: Environmental, Social, and OHS indicators that have been monitored since the last monitoring visit; details about the condition of the workstations; Information about the prevailing weather conditions during the reporting period; Photographic documentation to visually support and illustrate the reported information. This is to provide a comprehensive view of the project's compliance with environmental, social, and OHS standards, as well as the conditions at the work site.
- The Supervision Consultant experts review and approve contractor reports and submit them to PIU on a monthly basis.
- PIU submits environmental/social progress as part of their quarterly project progress reports to the WB on a quarterly basis.

All incidents must be recorded and reports in the regular monthly progress reports.

In case of severe incidents (e.g. fatality on site) immediate reporting within 24 hours to CDR and within 48 hours to the WB must be done.

7 Consultation, Disclosure and GRM

7.1 Public Consultation

The public participation meeting was held at Jounieh municipality building on Friday July 28. Invitations were sent by the consultant on behalf of CDR to concerned municipalities and NGOs through official letters. A sample of the invitation letter is attached in Annex 8. Invitations were sent to the concerned parties at least one week in advance from the meeting date. The number of attendees was 17 of which 6 were women.

Invited local NGOs include Yasa, Amel Association, Fifty-fifty, Women in front, Auberge Beity Association, and Frontier s rights. As for international NGOs, ACTED, ANERA, and DRC were invited. Out of the invited local NGOs, only YASA attended the meeting. Details in relation to invited NGOs are presented in Annex 8.

During the meeting, attendees were informed about the project objectives, the identified natural, economic, and social resources of importance in the area, the project's possible environmental and social risks and the planned mitigation measures. Further, the project GRM was introduced.

The primary focus was on discussing the road selection process for routine maintenance, including the possibility of incorporating non-primary roads into the scope of work. Attendees emphasized the urgent need for maintenance activities on secondary roads, particularly in small

municipalities, and sought assistance in this regard. Given the constraints of limited funds for maintenance, the Consultant clarified that international and primary roads would receive higher priority. The MoWT will collaborate with CDR to select the roads to be maintained: MoWT provides a list of candidate roads to CDR, who will then assess their eligibility for routine maintenance activities (i.e. the Consultant Engineer will undertake the assessment). In response to this, municipalities expressed their intention to submit request letters for the assessment of specific roads to both the Consultant and the MoPWT. As part of the public participation meeting, some municipality representatives shared letters relating to their requests. Annex 8 of the ESMP contains samples of received letters requesting the inclusion of specific roads within the project's scope (letters from Ghabala and Moaisra municipalities). These requests will be examined the Consultant Engineer, as explained to attendees.

The head of Kfour municipality provided positive feedback about the execution of the project in Kfour (REP phase 1 - rehabilitation works). The local community is highly satisfied, and he reassured that no disturbances were noticed during the entire duration of the project. The coordination with the municipality remained continuous throughout the project, and a TMP was successfully implemented to ensure the safety of passengers and users of the affected road.

The YASA director emphasized the significance of private initiatives in supporting road routine maintenance, aligning with the continuity of REP objectives. He informed the municipalities about YASA's collaboration with local citizens on private road safety projects, which involve improving specific spots to enhance the safety of road users. According to him, these initiatives and approach serve as a solution for roads that will not be included in the REP.

Finally, the Consultant explained that all relevant municipalities will be informed upfront before the commencement of works about the Project. 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.

7.2 Grievance Redress Mechanism (GRM)

A multi-channeled GRM was established for REP project in Kesrouane Caza to register and address grievances and complaints from all project stakeholders. Anonymous grievances will be addressed in both GRMs for communities and workers. The maximum anticipated time needed to close a GRM case is 45 days.

7.2.1 GRM for Surrounding Communities

The REP GRM has been established and is already accessible to communities to send their concerns and complaints. Citizens will be informed about the GRM mechanism before commencement of work through municipalities (i.e. through public announcement letters that will posted at the public board of concerned municipalities including the number of Contractor’s site engineer to be contacted and also through project sign boards). REP GRM levels are as follows and the schematic illustration is shown in Annex 5:

- Level 1: If any person has any complaint or concern regarding the project implementation, he/she can lodge an oral or written grievance to the site Manager. In case an oral complaint is made, it should be written by the Contractor Social expert. The issue must be resolved within a maximum duration of one week.

- Level 2: If the person is not satisfied with the action of the Contractor, he/ she can send the complaint to the PIU social specialist through Phone: 01980096 ext:317, Email: GRM.REP@cdr.gov.lb or official letter registered at the CDR. The issue shall be resolved within a maximum of two weeks.
- Level 3: If the person is not satisfied with the decision of the social specialist of PIU, he or she can bring the complaint to the attention of the PIU Director's Office. Once the PIU Director receives the complaint, it needs to be resolved within a maximum of two weeks. Citizen can also register an official letter at the CDR (Address: Tallet al Serail - Riad el Solh, Beirut – Lebanon).

All complaints will be individually followed up on and documented accordingly in a GRM log. 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 (i.e. the Contractor social expert will report to the Supervising Consultant expert who will report monthly to the PIU (CDR) who will, in turn, submit the consultants' monthly reports to the WB).The Complaints Register form or GRM log (refer to Annex 6) includes details/ nature of the complaint, the complainant's name and their contact details, date, corrective actions taken in response to the complaint.

Finally, an online form has been designed using the IMPACT platform to allow citizens to share their feedback (https://cdr.impact.gov.lb/worldbankmobile/home/main?lang=en). The link was shared with concerned municipalities and NGOs during the public participation meeting. It was also clarified that for each worksite in Kesrouane a link to the form will be shared with the local communities via location-based SMS, email and social media. At each worksite, a QR code will also be added on the project sign board (which already includes the project GRM) to automatically direct participants to the online form.

7.2.2 GRM for Workers

Similar to the GRM for surrounding communities, a GRM for internal employees, namely the labors onsite are also necessary. It aims to allow labors to report any wrongdoings in their favor or important concerns they might have. Workers must be informed about this GRM before commencement of works through induction training (refer to section 6.2). 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 E&S expert and has a duration of one week. The second level involves reporting to the PIU Director and should be resolved within one weeks. It also follows the Complaints Register form (refer to Annex 5).

8 Conclusion

Assessments showed that the project risks are localized, moderate, and can be mitigated if the Contractor succeeded to implement this ESMP, which documents the project's risks management strategy. In order to achieve that, CDR (i.e. the Supervising Consultant) plays a major role in assisting and supervising him during project implementation.

Most importantly, this ESMP guides the Contractor on critical road segments that need special care if they are to be maintained. Noting that local communities were engaged and their

concerns were integrated in the management strategy. However, engaging stakeholders is a continuous process that needs to be effectively adopted by the Contractor.

Finally, if the Contractor succeeded in complying with standards and in ensuring a safe operation of activities, the project is expected to enhance the safety conditions of the concerned roads and most importantly create short-term employment opportunities to local residents and Syrian refugees.

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10 Annex 1: Figures and Tables Related to Chapters 2 and Chapter 3

Table A National Applicable Legal Framework

Relevant Sector	Legislation	Date	Brief Description	Relevance to The Project
Environment	MoE Decision 52/1	29/06/1996	Environment quality standards and criteria for air, water and soil pollution. Revised standards for water, air and soil pollution (partly updated in Decision 8/1 dated 30/1/2001).	Decision 52/1 was referenced in the study to specify the National Standards for Environmental Quality and the Environmental Limit Values for Air and Water. The described decision (Annex 12 in decision 52/1) was used for monitoring air emissions.
	Decision No. 34	1997	Nahr Ibrahim protected by MoE under this decision	When primary roads are close to Nahr Ibrahim, special attention is needed
	Decision No.97	1998	Nahr el Kaleb protected by MoE under this decision	When primary roads are close to Nahr el Kaleb, special attention is needed
	Decision 8/1	30/01/2001	Amendment to part of MoE Decision 52/1 dated 29/6/1996. National Standards for Environmental Quality (NSEQ) that covered air and liquid emissions for all sectors.	This decision will be used to monitor air and water quality during implementation of project activities.
	Law 444	29/07/2002	Environment Protection Law: Fundamental principles and public rules (7 parts, 68 articles), Organization of environmental protection, Environmental information system and participation in the management and protection of the environment, Environmental Impact Assessment, Protection of environmental media, Responsibilities and fines. Other regulations (miscellaneous, institutional).	It is essential for the proposed project as the protection of the environment is a must throughout all of the steps of the project.
	Law 77	13/04/2018	Water Resources Law	Penalizes unauthorized discharges or disposal of any kind of waste in water resources
	Law 78	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
	Law 80	10/10/2018	Integrated Solid Waste Management which sets integrated solid waste management principles and provides guidelines for the management of waste.	Solid waste generated during the project should be managed in accordance with Law 80, which includes limiting quantities generated, when possible, as well as properly disposing of any generated waste.
	Decree 5605	11/09/2019	Decree 5605 focuses on the importance of source sorting, reducing and reusing, the sorting method according	The generated domestic solid waste are to be properly sorted as per decree 5605

			depending on the type in order to protect the environment and reduce the damages.	
	Decision 16/1	2022	Updated ELVs for air quality stated in Decision 8/1 and stated additional parameters for various industries.	Exhaust emissions from mobile onsite generators and heavy machinery should abide by the standards set in this decision
Health and safety	Law 64	12/8/1988	Protection against hazardous wastes that could harm air, water, biodiversity, soil, and people.	Precautionary measures should be taken to limit any potential damage from generated hazardous wastes (if any)
	Decree 11802	30/01/2004	Occupational health and safety decree	The occupation health and safety conditions during maintenance works should comply with this decree.
Labor Laws	Labor Law	23/09/1946	Labor Law that sets basic labor rights in Lebanon including minimum working age, working and resting hours etc.…	It protects employees from any sort of violations dictated in this law.
	Law 335	2/8/2001	This law is the ratification of ILO convention No. 182: The agreement required the ratifying country to take immediate and effective measures to prohibit the worst forms of labor and eliminate it and specify the types of work that harm the health, safety or ethical behavior of children and their location.	Does not allow the employment of children and protects them from engaging in any work activities that could harm their health and safety.
	Law 400	5/6/2002	This law is the ratification of ILO convention No. 138: This agreement aims to develop a general instrument on the subject of minimum age for employment to gradually replace the instruments applied in specific economic sectors, aiming to completely eliminate child labor	Minimum age of employment on tasks and works that pose risks or hazards to health and safety
	Decree 8987	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.
	Decree 3791	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.
Traffic	Law 243	22/10/2012	Aims at the elimination of any kind of traffic violations such as: exceeding the speed limit, driving without a license or driving under any substance alternating the normal mental and physical state.	All transportation vehicles utilized during project implementation should abide by the general rules specified in Law 243.
General	Decree law 166	7/11/1933	Antiquity law (166/LR) regulates antiquities and Directorate General of Antiquities (DGA) has the authority to halt any development that is damaging archeological deposits.	Defines chance find procedures that should be followed in case antiquities were identified in the project site

	Decree 340	01/03/1943	The text of Article 522 of the Lebanese Penal Code, applies to cases of assault of women, by force, violence, and manipulations which are acts that affect a woman's dignity, physical health, psychological state, and moral integrity.	This law was mentioned as the project may hold risks on women during maintenance work.
	Law 118	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.
	Law 58	29/05/1991	Law of properties and expropriation	Despite that no expropriation activities will be done; this law is added because OP 4.12 was triggered by the project.
	Law 53	14/09/2017	Abolishment of article 522 of the penal code that exempts a rapist from punishments if he marries a victim	This law was mentioned as the project may hold risks on women during maintenance works (influx of workers (men) to the concerned area).
	Law 28	16/02/2017	Right to access information.	This law should be followed throughout the implementation of the project.
	Decree 6940	24/09/2020	Determining the minutes of application of Law No. 28 date.	This decree should be followed throughout the implementation of the project.
	Law 205	30/12/2020	Criminalizing sexual harassment and habilitating its victims.	This law should be implemented, in case of sexual harassment.

Lebanon’s legislative body is represented by the Lebanese Parliament that approves and issues Laws. Lebanon’s executive body is represented by the Council of Ministers (COM) and is headed by the Presidency of the Council of Ministers. The COM enacts regulations in the form of Decisions (denoted COM Decision Number) and Decrees. Decisions are issued by a specific minister and are limited to the affairs of the ministry that promulgated it. Ministerial Decisions are subject specific

Table B Institutional framework

Institution	Roles and Responsibilities
MoPWT	MoPWT is responsible for the management of public roads, and for developing a sustainable strategy for the transportation sector within the urban and rural areas. o MoPWT will work closely with CDR during project implementation to ensure that important decisions on road (selection priorities, road designs, equipment specifications, and road asset management) are well coordinated.
CDR	CDR is a public institution established through Decree No. 5 dated 31st January 1977. CDR's main responsibilities is to: o Coordinate with relevant government agencies and with the relevant government agencies, particularly MoPWT, regarding roads priorities, technical aspects, and project's requirements. o Monitor the project. In particular, every six months CDR must submit to the Bank project progress reports summarizing all project aspects and progress achieved in project implementation.
Municipalities	o Municipalities in Kesrouane Caza are responsible for their municipal area. According to Decree 118/1977, municipalities are responsible for supervising projects' implementation in their municipal territories. In this context they were consulted for this project.
Ministry of Environment (MoE)	o MoE is responsible for planning and monitoring of environmental issues. o MoE is in charge of protecting the environment in general, setting regulations and standards, and advising on implementing projects and programs in a sustainable manner. Accordingly, this ESMP must comply with the Lebanese environmental standards and regulations issued by MoE.
Ministry of Agriculture (MoA)	o MoA is responsible for monitoring all activities related to forestry and agriculture. It regulates the introduction of new species in agriculture and livestock, protects, supervises and manages natural resources and provide technical assistance whenever necessary. o The REP will not involve the construction of new roads or widening of existing ones (i.e., no tree cutting will occur). However, in the context of maintenance works, if the contractor had to cut native trees for traffic safety issues, the MoA must be consulted. Tree cutting permits are provided by MoA.
Ministry of Energy and Water (MoEW)	o Monitoring the quality and determination of surface and groundwater. o Design, study, and implement major water infrastructure installations. o Protecting water resources from waste and pollution by taking the necessary measures to prevent pollution.
Traffic Department at	o Ensuring public safety o Maintaining regular traffic control

the Internal Security Forces	
Ministry of Labour (MoL)	o MoL is responsible for all labour and employment issues. Labour inspection is the responsibility of the Department of Labour Inspection, Prevention and Safety (DLIPS) under the Labour Relations Authority of the MoL. o DLIPS supervises the implementation of all laws, regulations, decrees and rules pertaining to the terms and conditions of employment, and the protection of workers in the workplace, including the provisions of international labour Conventions ratified. Labour inspectors ensure the supervision of compliance with regulations regarding conditions of employment and protection of workers including occupational safety and health. The works contracts must comply with the national law on labour and the ILO obligations, which have been ratified by Lebanon

International Treaties and Conventions in relation to REP.

Date	Convention/Agreement	Status	Relevance to Project
1992	United Nations Framework Convention on Climate Change.	Covered by Law No. 359 dated 11th August 1994.	This project must control activities that release green-house gases such as emissions from machineries used (most of which rely on fuel).
1992	Rio de Janeiro Convention on Biological Diversity.	Covered by Law No. 360 dated 11th August 1994.	This project should abide by this convention to avoid or control activities that may pose a threat on biodiversity at all levels, since improvement of roads sometimes leads, directly or indirectly, to the loss and degradation of natural habitats and biodiversity.

Table C Labor Conventions

ILO Convention	Name	Entry into force	Ratification Date	Description	Relevance to Project
ILO no. 29	**Convention Concerning Forced or Compulsory Labor**	01/05/1932	25/06/1977	Its object and purpose are to suppress the use of forced labor in all its forms irrespective of the nature of the work or the sector of activity in which it may be performed. With some exceptions such as military service.	This project should abide by this convention to protect employees from being forced into any type of work activity that they do not want to engage in.
ILO no. 105	**Abolition of Forced Labor Convention**	17/01/1959	25/06/1977	Aims at the elimination of forced labor and cancels certain forms of forced labor still allowed under the Forced Labor Convention of 1930	This project should comply with the guidelines of this convention in order to protect employees from being forced into any type of work

					activity without their will.
ILO no. 111	**Discrimination (Employment and Occupation) Convention**	15/06/1960	25/06/1977	Enable legislation which prohibits all discrimination and exclusion on any basis including of race/color, sex, religion, political opinion, national or social origin in employment.	This project should abide by this convention to ensure a healthy environment between the employees and between the employer and employees in the work place by enforcing equality and respect between them.
ILO no. 122	**Employment Policy Convention**	09/07/1965	25/06/1977	Aim at ensuring that there is freedom of choice of employment and the fullest possible opportunity for each worker to qualify for, and to use his skills and endowments in, a job for which he is well suited, irrespective of race, color, sex, religion, political opinion, national extraction or social origin.	This project should comply with the guidelines of this convention to ensure that employees are given the right opportunities, based on their qualifications, irrespective of their origin, affiliations.
ILO no. 138	**Minimum Age Convention for Admission to Employment and Work**	19/06/1976	25/06/1977	It stipulates that States should progressively raise the minimum age to a level consistent with the fullest physical and mental development of young people. It establishes 15 as the minimum age for work in general and 18 as the minimum age for hazardous work.	This project should abide by this convention in order to abolish the employment of children below the specified minimum age.

Table D Raw material and items needed for routine maintenance work

Item	Description	Unit
B	**Incidental Repair Works**	
B1	Clearing and Grubbing	m^2
B2	Repair and adjustment of manholes (replace damaged ones)	Nr
B3	Cleaning of waterways hydraulic structures, drainage pipes and box culverts	m^3
B4	Galvanized Steel Guardrail	lm
B5	Repairing Mortared Masonry wall	m^2
C	**Pavement Repair Works**	
C1	Shallow Patching works	m^2
C2	Deep Patching works	m^2
C3	Crack sealing	lm
C4	Trench Shallow Patching	lm
C5	Trench Deep Patching	lm
D	**Concrete Repair Works**	
D1	Cast-in-situ Reinforced concrete, Class 250/20 (B25) for repair of box culverts, headwalls and wing walls, concrete channels and retaining walls (all types and shapes)	m^3
D2	Plain concrete for patching for deteriorated concrete in culverts, channels, walls and safety barriers	m^2
D3	Cast-in-situ Reinforced concrete, Class 250/20 (B25) for channel's cover	lm
E	**Traffic Control Devices and Safety Barriers**	
E1	Road Paint Lines width	m^2
E2	Special Road Marking	m^2
E3	Cats eye	Nr
E4	Bituminous speed humps	m^2
E5	Rumble strips	lm
E6	Delineators J4	Nr
E7	Small Signs	m^3
E8	Concrete Single Face New Jersey Barrier free standing. Concrete class 360/20	lm

11 Annex 2: Figures and Tables Related to Chapter 4

Figure A Topography map for Kesrouane Caza

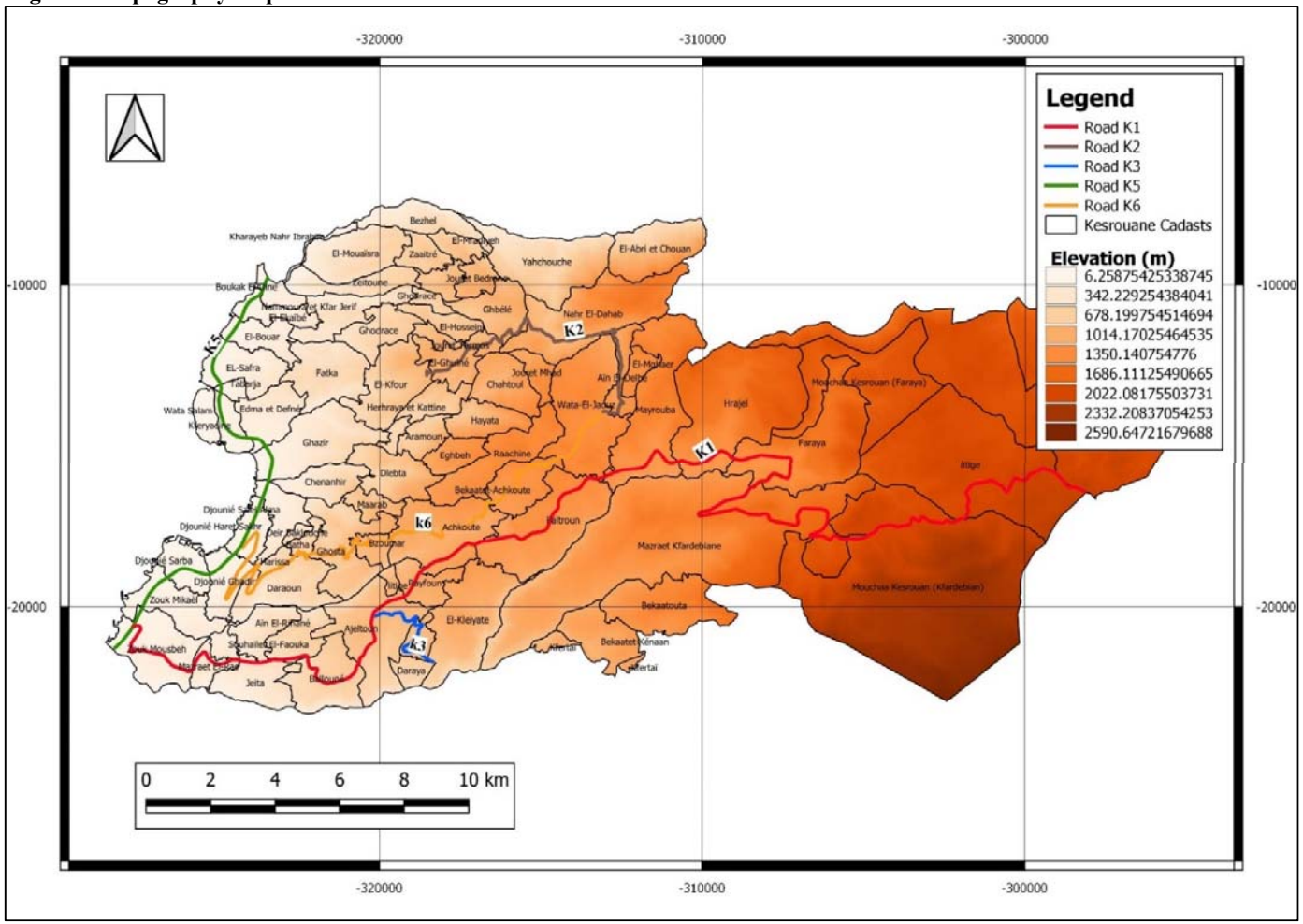


Table E Summary of main geological outcrops exposed along Kesrouane primary roads

Geology	Name	Description
C1	Chouf Sandstone (Grés de Base), Neocomian-Barremian	Varicolored, cross bedded Sandstone with inter-beds of shale; contains heavy minerals; color depends upon percentage of hematite and presence of volcanic giving purplish color; Sand is sometimes white; contains coal seams and traces of brittle amber. This formation can reach 300 meter in thickness.
C2a	C2a1: Abey Formation, Lower Aptian	Clastic: mixture of clay, sand and calcareous material in varying proportions forming clay, sandy clay, marl, marly limestone etc. The calcareous material may be slightly to moderately indurated. Where marl prevails, its fresh color is bluish, weathering to creamish brown. This formation can reach 125 meter in thickness.
	C2a2: Mdeirej Limestone, Lower Aptian	Karstic, massive marine depositional environment Limestone forming a prominent cliff, which often used as a marker bed. Transition with the Abey Formation consists of three layers of green clay intercalating limestone. This formation is outcropping to the East of the site and it can reach 45 meter in thickness.
C2b	Hammana Formation, Upper Aptian	Marl intercalated with marly Limestone with thick layers of Sand on top; layers of ferro-oolitic limestone sometimes overlie the sand. This formation can reach 20 meter in thickness
C3	Hammana Formation, Albian	Green Marl (containing glauconite) intercalated with thick layers of marly Limestone forming cliffs 3 - 4 m in height; may contain some thin sand layers in the lower part of the formation. This formation can reach 150 meter in thickness.
C_4	Sannine Limestone, of Cenemonain age	(C_4); this unit is divided into three subunits: **C_{4a}**: Dolomitic Limestone, within this formation, geodes of different sizes filled or voided can be recorded. Thickness of this unit is about 300 meters. **C_{4b}**: Bluish marl and shale containing crystals of quartz, chert nodules and bands form. Thickness of this unit is about 100 meters. **C_{4c}**: Limestone and dolomitic limestone white to brown in color. Limestone is highly karstified. Thickness of this unit is about 300 meters.
C_5	Maameltain / Ghazir Limestone	Composed of hard crystalline and micritic limestone to dolomitic limestone, creamish white to brown in color, while the weathered color is mainly gray. Limestone / dolomitic limestone is highly karstified and within this formation, geodes of different sizes filled or voided are recorded.
J6	Bikfaya Limestone, Portlandian epoch	Finely crystalline, massive, cliffy Limestone that includes trace to abundant brown chert nodules. This formation is chemically deposited with smooth fresh fracture. The thickness of this unit is ranging from 60 to 65 m and Type section is Bikfaya.
Q	Quaternary formation, belonging to the Quaternary age	This formation can reach a thickness of 100 m and typically consists of sandy beaches, detrital LS, conglomerates, volcanic coastal or alluvial deposits
bj6	Black Basalt	Volcanic formation with about 50 m of thickness, overlapping J6 (Bikfaya Limestone). This type is an impermeable rock, aquiclude layer that results in seasonal spring discharges.
J7	Salima limestone	Composed of Chocolate brown Shale and bluish Marl, in many parts it's intercalated with thick oolitic Limestone bed. The marl weathers to a creamish, ochre color and Crinoids fossil can be recorded in this formation. Thickness varies from zero-few meters to 150 m. Type section is Salima.
M2a	Miocene	Loose marine greenish marl, that weathers to grey marl. In some parts this formation is inter-bedded with marly limestone. Thickness of this outcropping is around 150 m and it is reach in foraminifera fossils.

Source: Dubertret, (1945)

Figure B Geology map for Kesrouane Caza showing exposed outcrops and % of exposure of each class

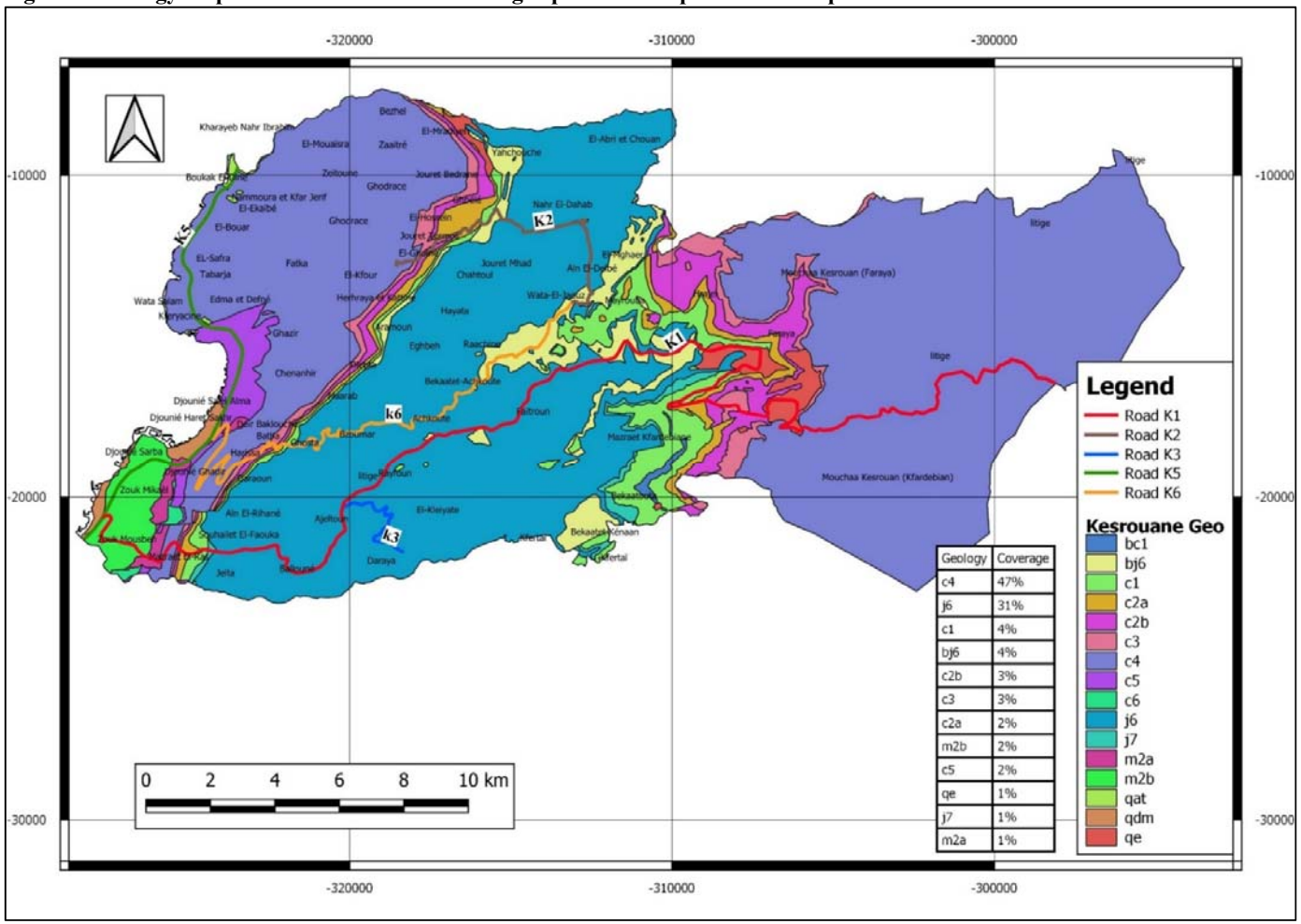


Table F Geological outcrop coverage for the representative roads within Kesrouane Caza

Road K1	Coverage (%)
j6	36%
c4	24%
qe	11%
c1	7%
bj6	6%
m2b	6%
c2a	4%
c3	3%
c2b	2%
m2a	1%
K3	**Coverage (%)**
j6	100%
Road K6	**Coverage (%)**
j6	41%
c4	25%
bj6	20%
c3	6%
c5	2%
c2b	2%
c2a	1%
m2a	1%
c1	1%
Road K2	**Coverage (%)**
j6	43%
bj6	22%
c2a	10%
c2b	8%
c4	7%
c3	6%
c1	4%
Road K5	**Coverage (%)**
c4	33%
c5	25%
m2b	23%
qdm	11%
m2a	4%
qat	3%

Figure C Hydrogeological map of the Kesrouane Caza (showing water potential of the subsurface)- Refer to Table G for description of hydrogeology classes

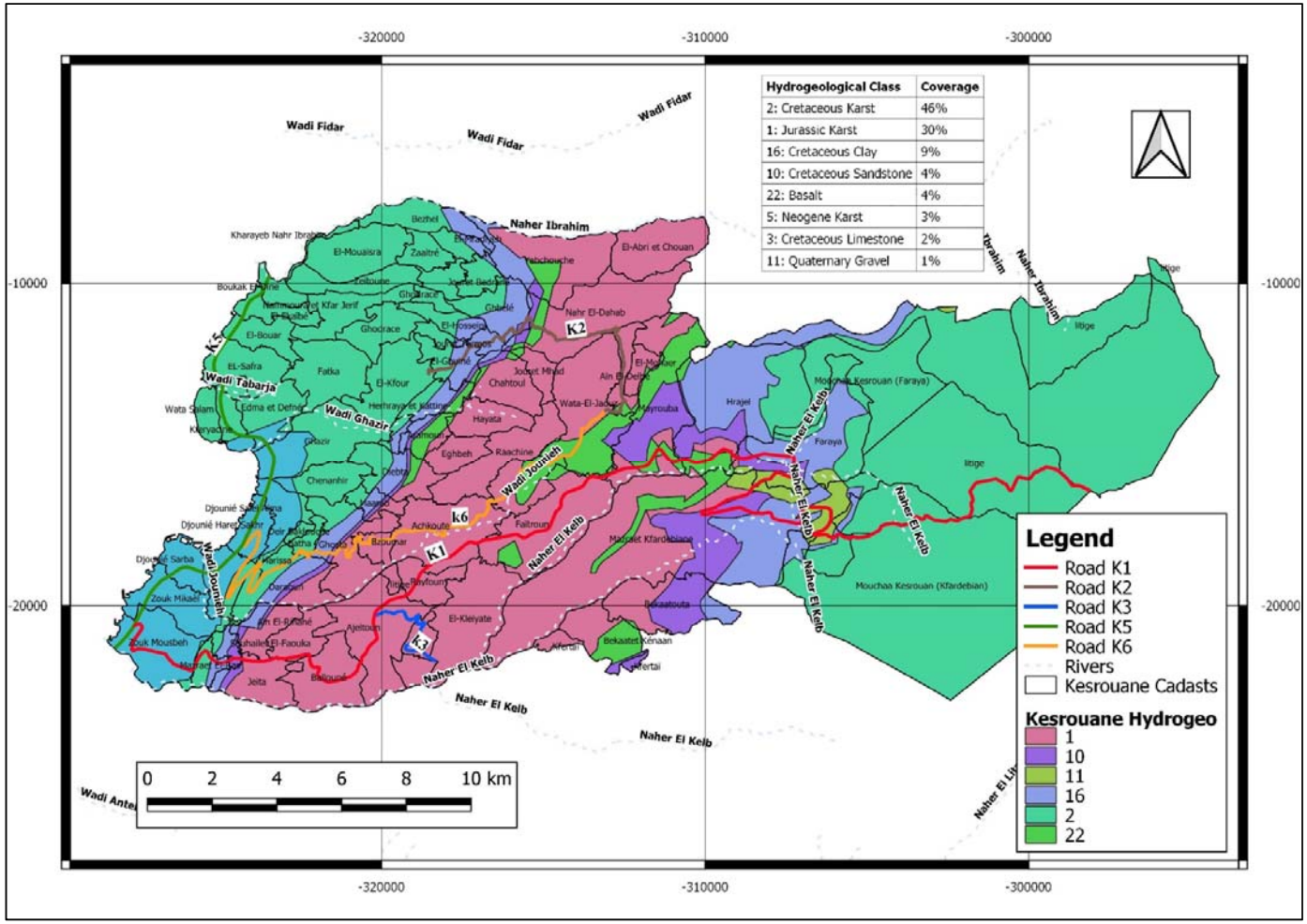


Table G Summary of hydrogeological classes exposed for all Kesrouane roads (legend of hydrogeological map)

Geology Class	Groundwater sheets		Lithology	Age	Flows of the Sources L/sec.	Probable Instantaneous Flows of the Works L/sec.	Transmissivity m^2/Sec
1	**In Karstic Formations** Wide And Rich Water Table		Massive limestone and dolomitic limestone with interval marls Thickness: >1000 m.	Jurassic Bathonien-Portlandien	<100 100-1000 >1000	>100	Generally, high $10^{-2} \leq T \leq 1$
2			Limestone regularly bedding Thickness: 800 à 1000 m.	Cretaceous Cénomanien-Turonien	<100 100-1000 >1000	>100	
3			Limestone and marly limestone beds of flint Thickness: ~ 200m.	Cretaceous Turonien	100-1000 >1000	>100	
10		**Local or Discontinuous Water Table**	Sandstone Thickness : 150 à 250 m.	Cretaceous Grès De Base	<10	<10	$10^{-5} \leq T \leq 10^{-4}$ Poor with weak
11			Detachments gravel slopes and mud flows. Thickness: variable	Quaternary	_	<10	Poor with weak
16	**Areas Generally Without Water Table or a Very Local Water Table**		Alternations of clay-sandy, limestone beds and marl Thickness: 300 to 400 m.	Cretaceous Aptien_Albien	<5 (Sources intermittent)	<5	Weak with very weak
22			Basalt of variable thickness	Cretaceous Inf. Miocene Pliocene Quaternary	_	Very weak	Very weak

Table H Hydrogeological classes coverage (%) per each inspected road in Kesrouane Caza (50 m fixed buffer)

Road K1	**Coverage (%)**
1: Jurassic Karst	38%
2: Cretaceous Karst	23%
16 Cretaceous Clay	9%
11: Quaternary Gravel	9%
10: Cretaceous Sandstone	7%
5: Neogene Karst	7%
22: Basalt	7%
Road K5	**Coverage (%)**
2: Cretaceous Karst	38%
3: Cretaceous Limestone	37%
5: Neogene Karst	25%
Road K3	**Coverage (%)**
1: Jurassic Karst	100 %
Road K2	**Coverage (%)**
1: Jurassic Karst	48 %
16: Cretaceous Clay	25%
22: Basalt	10%
2: Cretaceous Karst	10%
10 :Cretaceous Sandstone	7%
Road K6	**Coverage (%)**
1 Jurassic Karst	45%
2 Crestaceous Karst	28%
22 Basalt	14%
3 Cretaceous Karst	9%
16 Cretaceous Clay	3%
10 Cretaceous Sandstone	1%

Table I Existing surface water in the Caza with respect to representative roads

Road Name	**Proximity to River**
K1	• Situated between Nahr El Kaleb and Wadi Jounieh and runs parallel to both of them. • Very close to Nahr El Kalb in Mayrouba and Hrajel (~200m) and intersects with the river several times in Faraya, Mazraat Kfardebian, and Mchee Kesrouane (Kfardebian)
K5	• Intersects with Nahr el Kalb in Zouk Mosbeh coastal area • Intersects with Wadi Jounieh river in Sarba coastal area • Intersects with Wadi Ghazir river in Ghazir coastal area • Intersects with Wadi Tabarja river in Tabarja coastal area • Intersects with Nahr Ibrahim river in Bkak El Dine coastal area
K6	• Runs parallel to Wadi Jounieh in all villages and is very close and intersect with the river in Achkout and Bekaatet Achkout

Table J Main Springs in Kesrouane Caza with respect to road alignments

Spring	Road Name	Nearest Distance (m)
Nabaa El Assal	K1	947
El Laban	K1	251
Ain Ed Delbe	K2	10
Nabaa El Mghara	K1	471
Nabaa El Qana	K1	2,895
Nabaa Ech Charir	K2	853
Nabaa Es Souane	K1	507
Nabaa El Tannour	K1	459
Nabaa El Tannour	K1	339
Faqra	K1	520
Jiita	K1	1,095

Figure D Existing springs in Kesrouane along road alignments

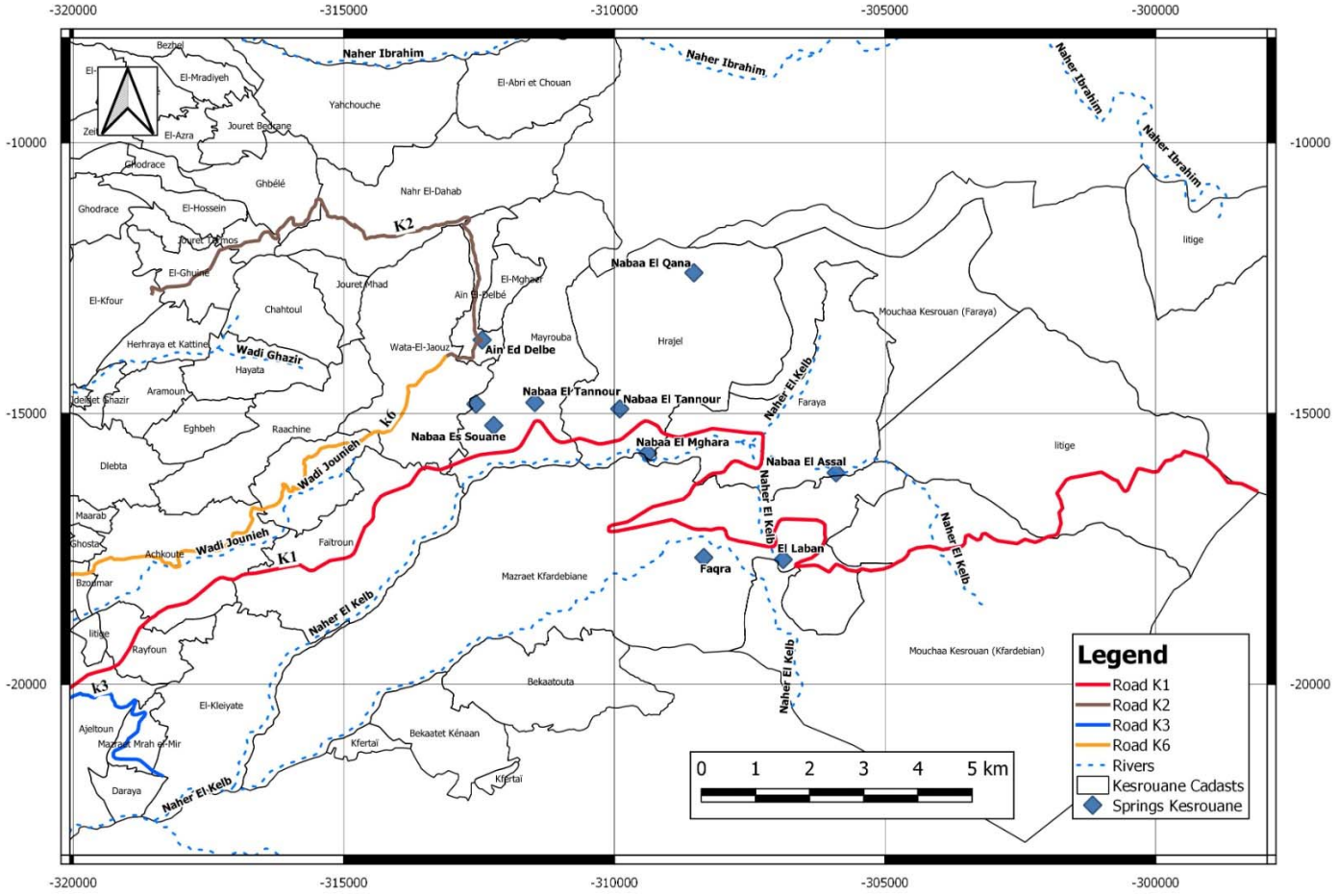


Figure E Distribution of air pollutant Nitrogen Dioxide (NO2) in the troposphere above the Lebanese border average from year 2018 up to August 2023 (data retained from Sentinel-5 precursor/TROPOMI Level 2 Product

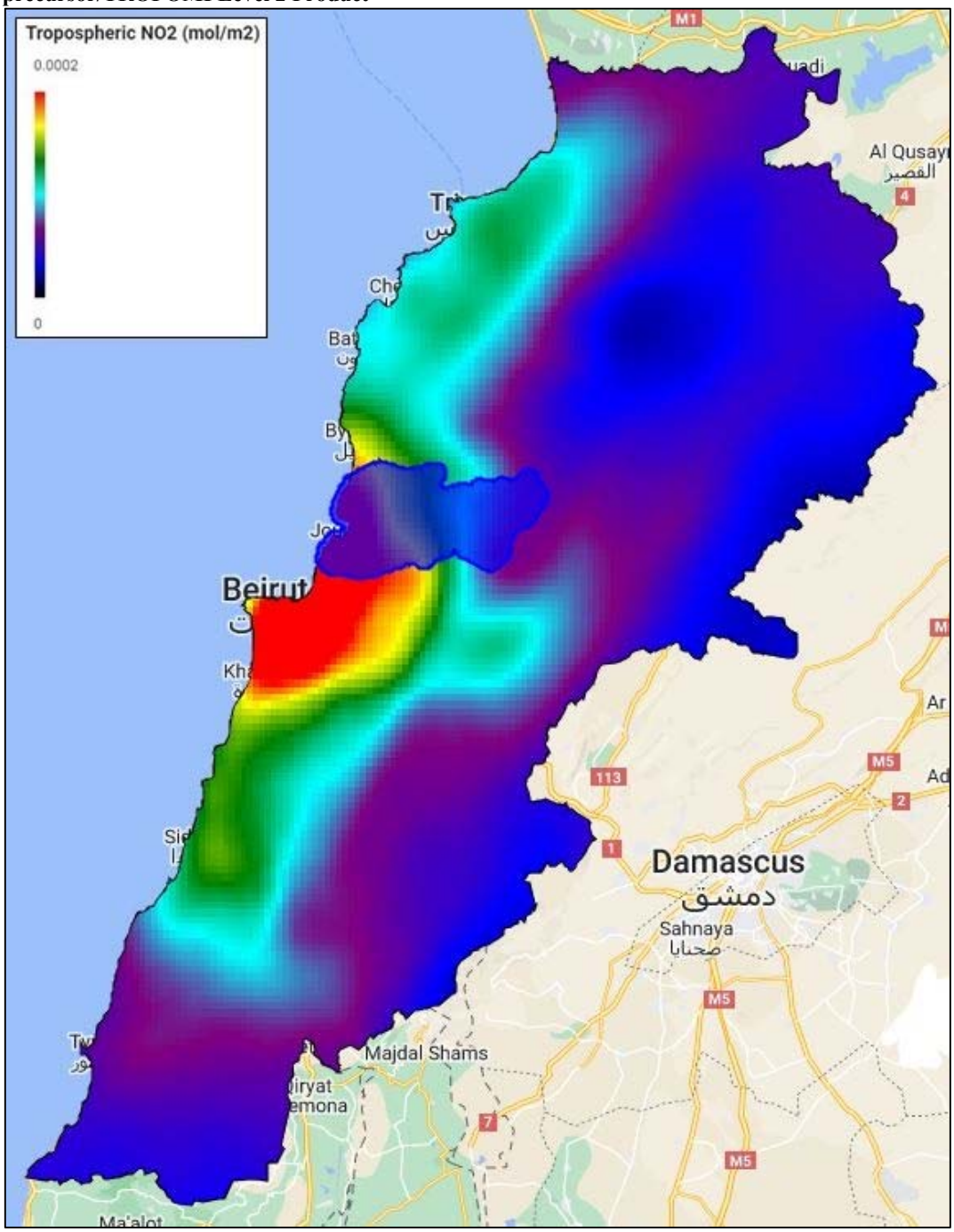


Table K Main natural habitats encountered along the roads in Kesrouane Caza

The biogeographic region ranges from the Thermo-Mediterranean near the coast to the Eu-Mediterranean and Supra-Mediterranean at Wata el Joz and Mountainous zone at the level of Oyoun el Siman. The altitudinal range plays an important role in plant composition (Abi Saleh, 1996).

Thermo-Mediterranean zone comprises at the sea level a coastal belt sheltering plant communities reflecting the beach habitat and consist at higher altitude of mainly Carob-lentiscus series and *Quercus calliprios* thermophilous series. The Supra-Mediterranean zone is characterized by a series of vegetation that are found on limestone substrata. The series of *Quercus calliprinos*, the series of *Quercus infectoria*; the series of *Ostrya carpinifolia* and *Fraxinus ornus* series; the *Pinus pinea* and *Pinus brutia* found on sandstone. Whereas, Mediterranean mountains are characterized by different forest groupings, quite rich and quite specialized floristically. Mainly cedar and fir trees are associated with varied deciduous oak trees that can also exist in scattered stand from particular subseries.

LULC analysis	**Field observations**
Dense pine forest	Pine forests (umbrella pine (*Pinus pinea*) and wild pine (*Pinus brutia*)
Outcrops	Bare rocks in garrigue Rocky outcrops
Low density oak forest	Oaq maquis
Mixed forests	Woodlands dominated by *Quercus infectoria*
Shrubland with scattered trees	Open garrigue vegetation Stony shrubland
Low density pine forest	Pine forests and woodlots on sandstone Clear pines intermixed with oak trees Clusters of Calabrian pine (*Pinus brutia*) trees
Grassland of medium density	Grasslands used for agriculture and forage (croplands)
Olives, field crops in small fields/terraces, deciduous fruit trees	Olive groves (*Olea europaea)*, fruit terraces, cultivated trees, and polytunnels
Medium density urban fabric	Rural settlements and urbanized areas

Figure F LULC map for Kesrouane Caza

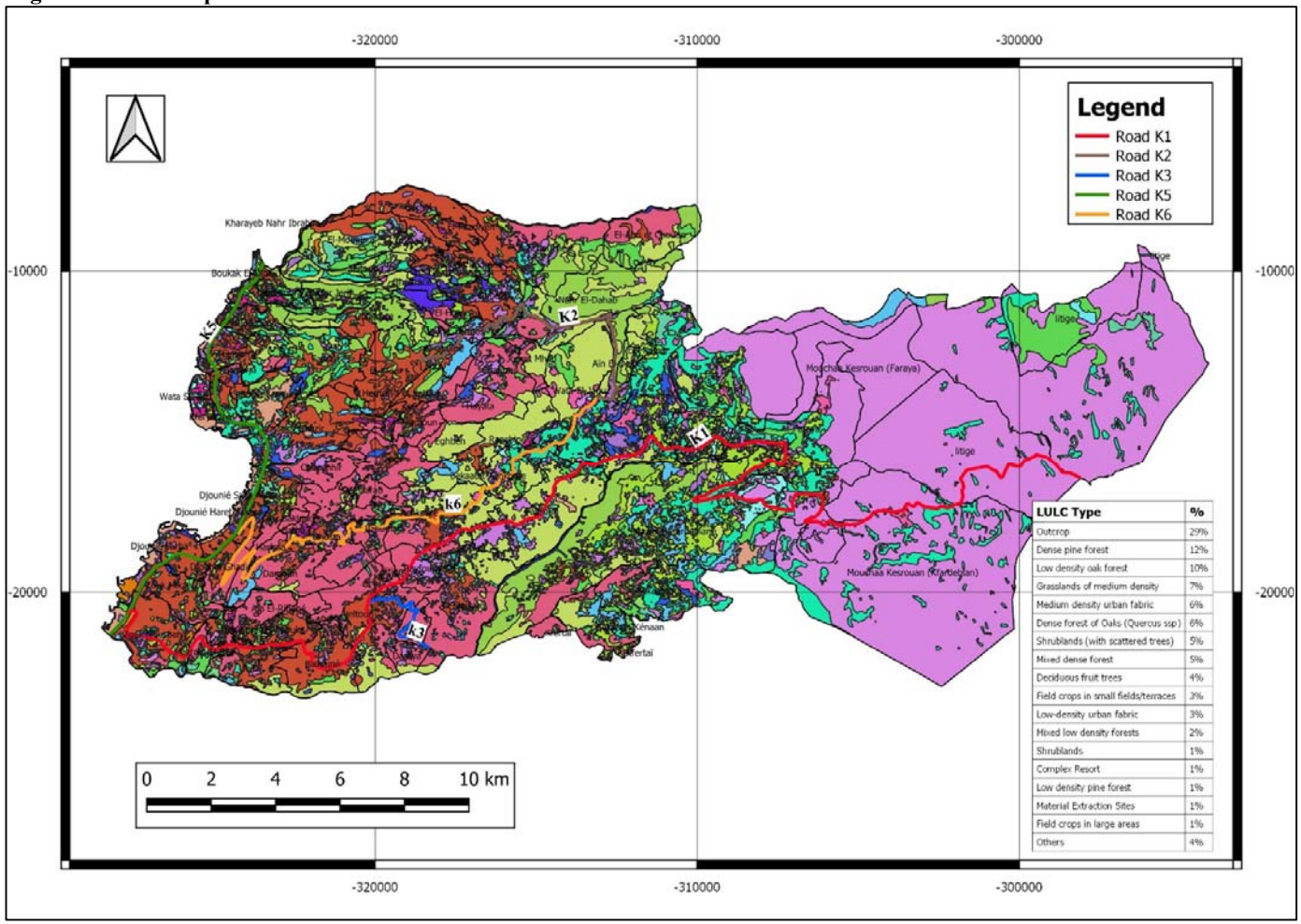


Table L Particular biotopes and natural habitats along the assessed roads

Road Name	Distance from Protected Areas (PAs), valleys, and rivers	%LULC along the road (50 m fixed buffer from centerline)	Elevation (m)	Vegetation zone (Abi Saleh & Safi, 1996).	Characteristics of Natural Habitats
K1	✓ Intersects with Nahr Ibrahim river several times in Faraya, Mazraat Kfardebian, and Mchee Kesrouane (Kfardebian) o Nahr Ibrahim is under the protection of the MoE, Deicion No.34/97) o Nahr Ibrhim valley- constitutes a dynamic hideout for numerous reptiles, mammals, and birds	24 % Outcrop 10% Grassland	27-2113	Thermo, Eu Mediterranean zones and Mountain zone	• Rocky outcrops provide habitat for a range of unique plants and animals. Also, characterized by one of the most important floral communities, with many endemics or rare species. Among the important flora that were recorded/potentially present in the study area: *Centaurea speciosa, Phagnalon kotschyi, Staehelina lobelia,* and *Thalictrum orientale* • Rocky slopes and plateau (in Oyoun el Siman) with a variety of mountain plant species and thorny mountain vegetation and cushion plants especially the *Berberis libanotica* and Ehrenberg small shrubs. Reptiles that are potentially present in the area include (*Montivipera bornmuelleri* (viper) and the lizard species *Phoenicolacerta kulzeri, Parvilacerta fraasi, Trachylepis vittata, and Laudakia stellio* (Hraoui-Bloque, 2012) • Riparian thickets were recorded along the road segment that intersects with river including Oriental Plane (*Platanus orientalis*), Willow trees (*Salix spp.*), Salix spp, *Juglan regia*, *Celtis australis* and shrubby vegetation namely *Rubus hedycarpus*. Further, vegetation was that of mountainous wetlands dominated by *Juncus* spp., *Scirpus* spp.and *Equisetum*. Riparian habitats are important refuge for amphibians, birds and reptiles. • Mediterranean maquis intermixed with residential and agricultural areas • Meadows near water channels • Grasslands used for agriculture and forage (croplands)
K2	✓ Ain Ed Delbe is only 10 m away from Road K2	25 % field crop 21 %Low density oak forest	895-1289	Eu-Mediterranean and supra-Mediterranean zones	• Mediterranean oak woodland, dominated by the evergreen oak species *Quercus calliprinos*, with a scattering of deciduous oak *Quercus infectoria* and

		10% dense forest of oak			other tree species including Strawberry Tree (Arbutus sp.) • Riparian • Mediterranean maquis that constitute a dynamic hideout for numerous reptiles, mammals, and birds. • Open garrigue vegetation, discontinuous bushy associations of the Mediterranean calcareous plateaus.
K3	-	47% dense pine forest	718- 898	Eu-Mediterranean zone	• Pine forest intermixing with residential areas • Olive groves • Open Garrigue vegetation
K6	✓ Intersect with Wadi Jounieh river in Achkoute and Bekaatet Achkout	• 26% dense pine forest • 12 % Grasslands of medium density	28 1366	Thermo and Supra-Mediterranean zones	• The road involves rural area, bordered by grasslands (overgrazed grasslands) and garrigue vegetation (rocky garrigue). • Some segments involve pine forest/ or dense pine patches (umbrella pine intermixing with wild pine *(Pinus brutia*) and kermes oak) • Wet habitats (grasslands) were noticed along the road

Table M Percent LULC distribution per road (50m buffer)

LULC K1	Coverage (%)
Outcrop	24%
Medium density urban fabric	17%
Grasslands of medium density	10%
Low-density urban fabric	7%
Dense pine forest	6%
Low density oak forest	6%
Deciduous fruit trees	6%
Field crops in small fields/terraces	5%
Shrublands (with scattered trees)	4%
Field crops in large areas	4%
Mixed dense forest	3%
Material Extraction Sites	2%
Shrublands	1%
Mixed low density forests	1%
Urban sprawl on dense forest	1%
Urban sprawl on permanent crops	1%
Others	3%
LULC K3	**Coverage (%)**
Dense pine forest	47%
Medium density urban fabric	20%
Low-density urban fabric	10%
Another type of leafy low density forests	7%
Grasslands of medium density	6%
Deciduous fruit trees	3%
Field crops in small fields/terraces	3%
Citrus fruit trees	2%
Diverse Equipment	1%
Urban sprawl on permanent crops	1%
Protected agriculture	0%
LULC K2	**Coverage (%)**
Field crops in small fields/terraces	25%
Low density oak forest	21%
Low-density urban fabric	14%
Dense forest of Oaks (Quercus ssp)	10%
Medium density urban fabric	9%
Grasslands of medium density	5%
Mixed dense forest	4%
Dense pine forest	3%
Shrublands (with scattered trees)	3%
Urban sprawl on field crops	2%

Mixed low density forests	2%
Deciduous fruit trees	2%
Protected agriculture	1%
Olives	1%
Others	1%
LULC K6	**Coverage (%)**
Dense pine forest	26%
Medium density urban fabric	20%
Grasslands of medium density	12%
Low density oak forest	8%
Field crops in small fields/terraces	6%
Protected agriculture	3%
Mixed dense forest	3%
deciduous fruit trees	2%
Shrublands with scattered trees	2%
Mixed low density forest	2%
Complex resort	1%
Urban Sprawl on dense forest	1%
Material extraction site	1%
Green urban area	1%
others	2%
LULC K5	**Coverage (%)**
Highway	30%
Medium density urban fabric	27%
Field crops in small fields/terraces	7%
Grasslands of medium density	7%
Shrublands (with scattered trees)	4%
Complex Resort	4%
Dense urban fabric	3%
Industrial or commercial area	3%
Shrublands	3%
Protected agriculture	2%
Low-density urban fabric	2%
Field crops in large areas	2%
Deciduous fruit trees	1%
Mixed low density forests	1%
Low density pine forest	1%
Outcrop	1%
Mixed dense forest	1%
Others	1%

Figure G Main LULC and habitats encountered along Kesrouane Roads

Urbanized segment along Road K1

Rocky garrigue vegetation along Road K1

Rocky habitat (outcrops) in Kfardibian along Road K1

Road K1: Jurd ecosystem in Oyoun el Siman

Open rocky garrigue bordering Road K1

Riparian thicket along Road K1

Residential houses bordering Road K2

Oak maquis bordering Road K2

Garrigue vegetation bordering Road K2

Agricultural terraces bordering Road K2

Olive groves along Road K3

Pine forest (umbrella pine intermixing with oak and wild pine trees) along Road K3

Agricultural polytunnel along Road K3

Oak maquis bordering Road K6

Pine forest (wild and umbrella pine) along K6 before reaching Harissa

Table N Main Sensitive receptors recorded along assessed roads in Kesrouane Caza

Receptor	Description	Road Name	Shortest Distance (m)
Mar Youhanna El Habib - Church	Church	K1	206
Christ Bible Baptist Church	Church		4
St. Charbel Church	Church		497
Faraya Municipality	Municipality		20
St Challita Church	Church		54
Eglise Saint Elie	Church		71
Al Kadyma Church	Church		44
Mayrouba Municipality	Municipality		203
College Saint Paul - Faytroun	School		140
Notre Dame de LumiÃ¨re Nazareth	School		164
El Ghine Municipality	Municipality	K2	13
Saydet Najat Church	Church		16
Saint Roch School	School	K3	42
Ajaltoun Technical School	School		70
Our Lady of Lebanon	Church	K6	208
Batha municipality	Municipality		135

Table O Sensitive receptors along Road K5 (highway)

Receptor	Description	Road Name	Shortest Distance (m)
St Elias Church	Church	K5	36
Saint Anne Maronite Church	Church		53
DOPS -JOUNIEH	School		73
St Doumit Church	Church		90
Fouad Chehab Stadium	Sports		107
Ste Sophia Church	Church		117
Saint Jack church	Church		121
Okaibeh Municipality	Municipality		123
Sarba Official School	School		132
St. Maroun Church	Church		142
Takasim music	School		160
KMC	Hospital		170
Bouar Public	Hospital		210
Jounieh Public High School	School		212
Tabarja Municipality	Municipality		261
St. John The Baptist Church	Church		306
Saint John School	School		320
Jounieh Municipality	Municipality		324

Figure H Main sensitive receptors along main roads in Kesrouane Caza

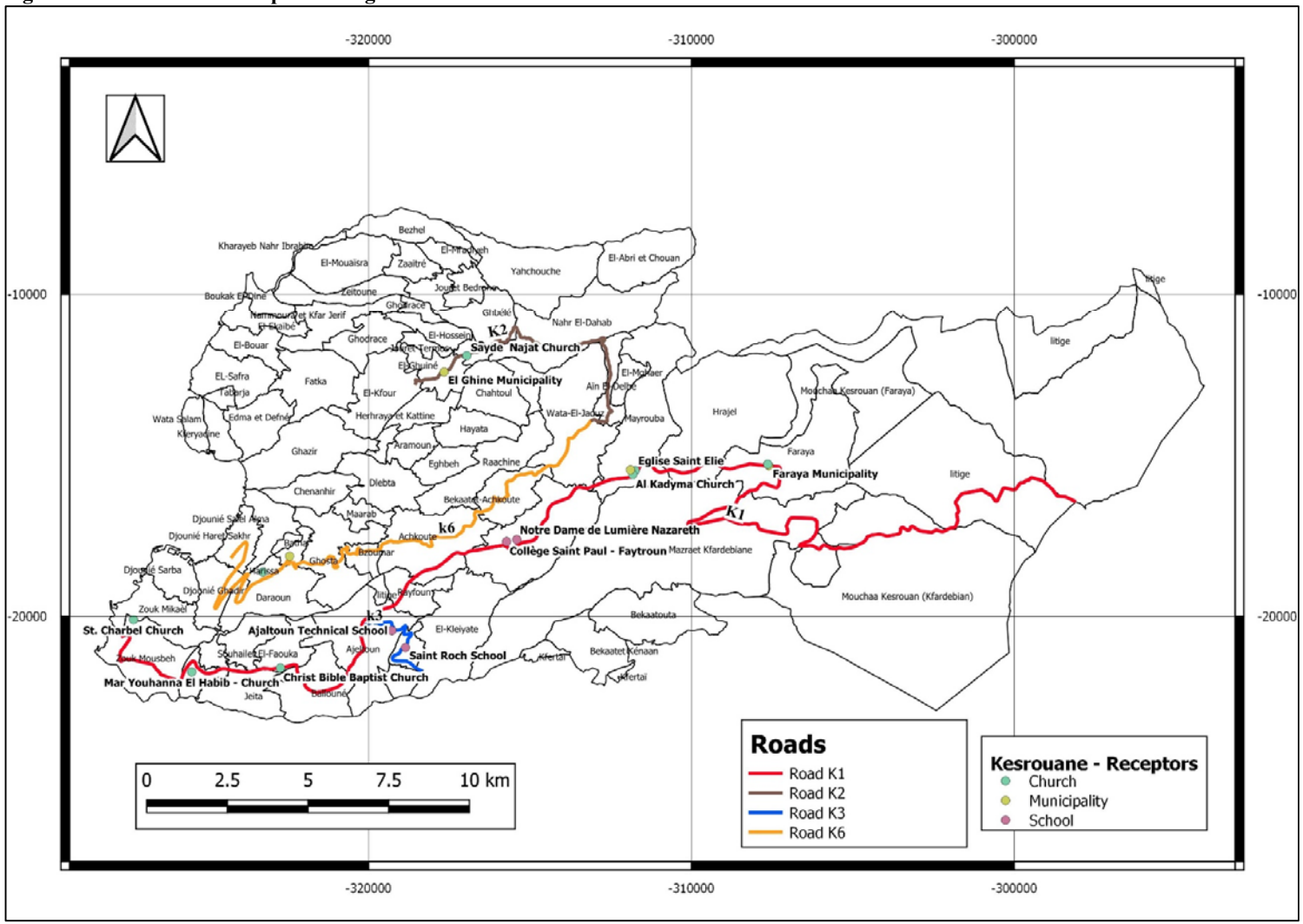


Figure I Main sensitive receptors along Road K5 (highway)

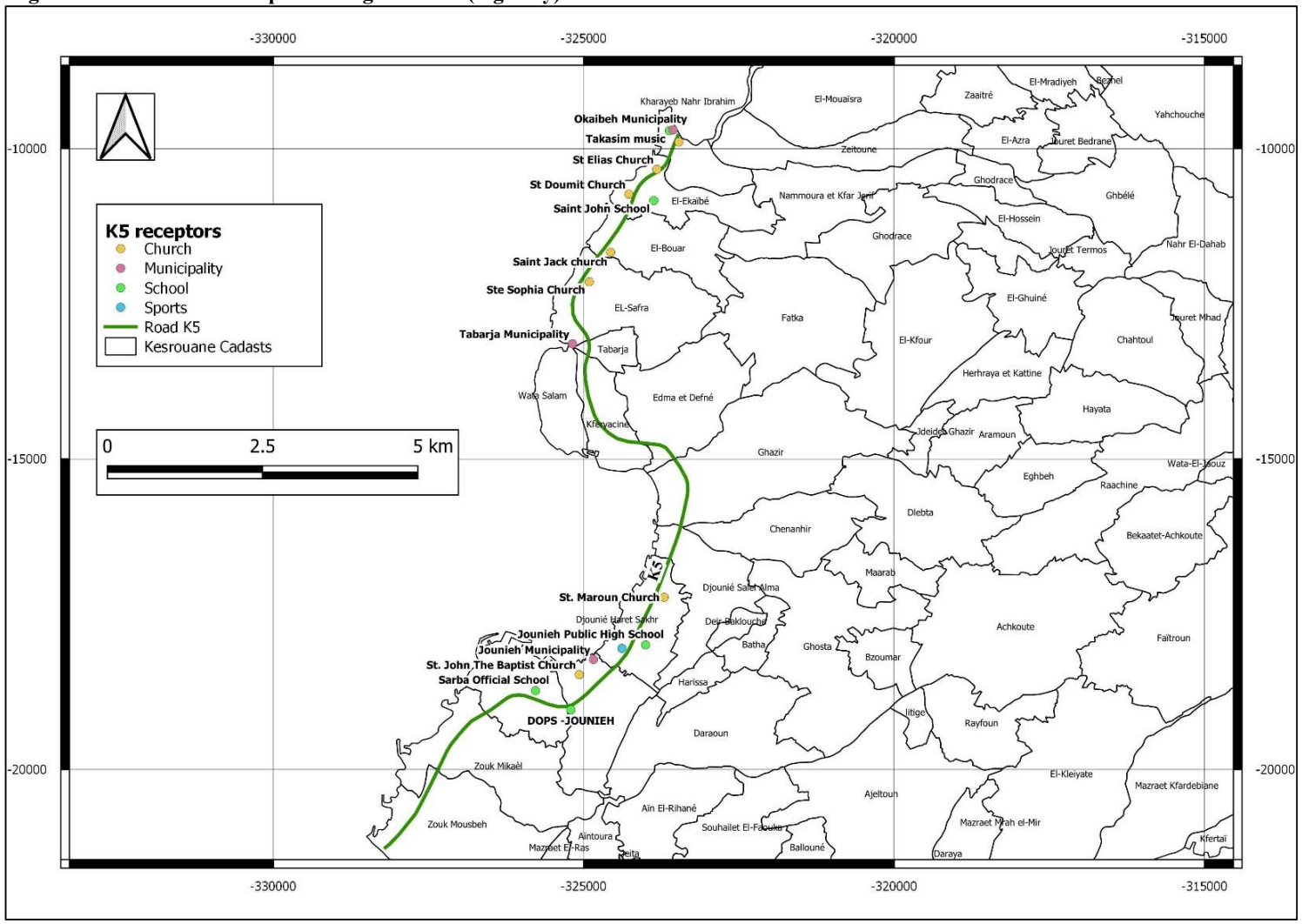


Figure J Some examples of sensitive receptors recorded along inspected roads in Kesrouane Caza

Faraya Municipality bordering Road K1

Shops and residential buildings bordering Road K1

Saint Roch School bordering K3

Agricultural terraces bordering Road K3

12 Annex 3: Impact Assessment Methodology

The assessment followed the Lebanese MoE grading methodology stated in Decision No 261/1, dated 2015. The impact grading methodology is explained in this section.

This approach was adopted in order to address the several sources of impacts from the project's activities. The stages of the evaluation process are the following:

- Identification of project-related activities (sources) and environmental aspects.
- Identification of potential impacts to the environment (physical, biological, human, cultural).
- Evaluation and assessment of the related unmitigated impact significance.

Impacts are first classified as shown in the table below:

Table P Classification of Impacts

Matrix	Classification	Criteria
N (Nature)	**P** (Positive)	The proposed activity offers benefits for the overall project
	N (Negative)	Impacts having minimal to major negative influence
	D (Direct)	Impact arising directly from the project activities
	I (Indirect)	Impacts arising from activities not directly related to the project development
M (Magnitude)	**L** (Low)	High potential to mitigate negative impacts on the physical, biological or human environment to the level of insignificant effects. Disturbance of degraded areas with little conservation value. Minor changes in species occurrence or variety. Simple mitigation measures may be needed to minimize impacts
	M (Moderate)	Medium range (beyond site boundary but restricted to local area). Medium-term (reversible over time, duration of operational phase). Potential to mitigate negative impacts on physical, biological or human environment. However, the implementation of mitigation measures may still not prevent some negative effects. Destruction/Disturbance of areas with potential conservation value. Complete changes in species occurrence or variety. Mitigation measures will help minimize impacts
	H (High)	Disturbance to areas of high conservation value. Destruction of rare or endangered species. Mitigation is required. Largely irreversible impacts on the physical, biological or human environment. Has a massive impact on the surrounding livelihood. Potentially irreparable damage to a site of social and/or cultural importance
E (Extent)	**L** (Local)	Limited to the project area Locally occurring impact within the locality of the proposed project
	G (Global)	Extend beyond the local area National impact affecting resources on a national scale
T (Timing)	**S** (Short-term)	Activities and their related impacts are characterized by a short duration of effect
	M (Medium-term)	Activities and their related impacts are characterized by a medium duration of effect
	L (Long-term)	Activities and their related impacts are characterized by a long duration of effect

Matrix	Classification	Criteria
D (Duration)	**C** (Construction)	Impacts arise during the construction phase of the proposed project
	O (Operation)	Impacts arise during the operational phase of the project
R (Reversibility)	**R** (Reversible)	Impacts may be reversible, or able to be rehabilitated upon the decommissioning of the proposed project
	I (Irreversible)	Impacts may not be reversible, or able to be rehabilitated upon the decommissioning of the proposed project
L (Likelihood of occurrence)	**L** (Low)	The classified impact is unlikely to occur under normal operating conditions
	M (Medium)	The classified impact may possibly occur
	H (High)	The classified impact is unlikely to occur under normal operating conditions
S (Significance)	**L** (Low)	Results in no substantial adverse change to existing environmental conditions
	M (Medium)	Substantial adverse change to existing environmental conditions Can be mitigated to less-than-significant levels by implementation of proposed potentially feasible mitigation measures or by the selection of an environmentally superior project alternative
	H (High)	Substantial adverse change to existing environmental conditions Cannot be fully mitigated by implementation of all feasible mitigation measures

The environmental significance matrix adopted is based on the well-known "weighted scoring" or "weighing and scoring" method used as a tool in various decision analysis applications. In this method, the following steps takes place:

- Attributes relevant to the project are chosen
- Weights or numerical values are assigned to each attribute depending on its importance (values should be based on objective data or expert opinion to exclude subjectivity during the process).
- Scores are allocated to each option to reflect its status with respect to each attribute

The final result is a single weighted score for each option, which is used to quantify its overall performance/significance. As such, the adopted matrix is designed to allow subjective conclusions to be numerically recorded or quantified, therefore providing at the same time an impact evaluation and quantitative record to revert to in the future:

Table Q Significance Impact Matrix

	Magnitude x Extent x Duration								
Likelihood x Frequency	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	2	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**
	3	**6**	**9**	**12**	**15**	**18**	**21**	**24**	**27**
	4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**
	5	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
	6	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**54**

Yellow: Negligible / **Green**: Low significance / **Blue**: Medium significance / **Red**: High significance

13 Annex4 Code of Conduct

Individual CoC in Arabic

Code of Conduct - مدونة سلوك

مشروع الطرقات والعمالة – Roads & Employment Project
الممول من قبل البنك الدولي (القرض رقم ٨٧٠٥ – لبنان)، بإدارة وتنفيذ مجلس الانماء والإعمار لصالح وزارة الأشغال العامة والنقل

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

١- التزام الاحترام والآداب العامة	●الالتزام بمعاملة النساء والرجال والشباب باحترام بغض النظر عن انتمائهم الديني، العرقي، الطائفي، اللغوي، التوجه السياسي، الاعاقة، الجنسية، الجندرة، الخ. ●احترام موقع العمل وادوات العمل المشتركة: نظافة المكان، عدم التعدي على الممتلكات العامة المجاورة للأعمال، الخ.
٢- عدم استعمال العنف بشتى اشكاله	●العنف القائم على النوع الاجتماعي: أيّ فعل مؤذٍ يُرتكب ضدّ إرادة الشخص. وهو مبنيٌّ على الفروق بين الذكور والإناث التي يُعزى وجودها لأسباب اجتماعية. ●العنف الجنسي: الاغتصاب، الاعتداء الجنسي، التحرش الجنس، 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.
٣- التحرش والاعتداء والاستغلال الجنسي	الالتزام بالتصدي لأي شكل من أشكال التحرش أو التمييز أو التخويف أو الاستغلال أو الاعتداء الجنسي بما في ذلك التعليقات المهينة المتعلقة بالميل الجنسي، القدح 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.

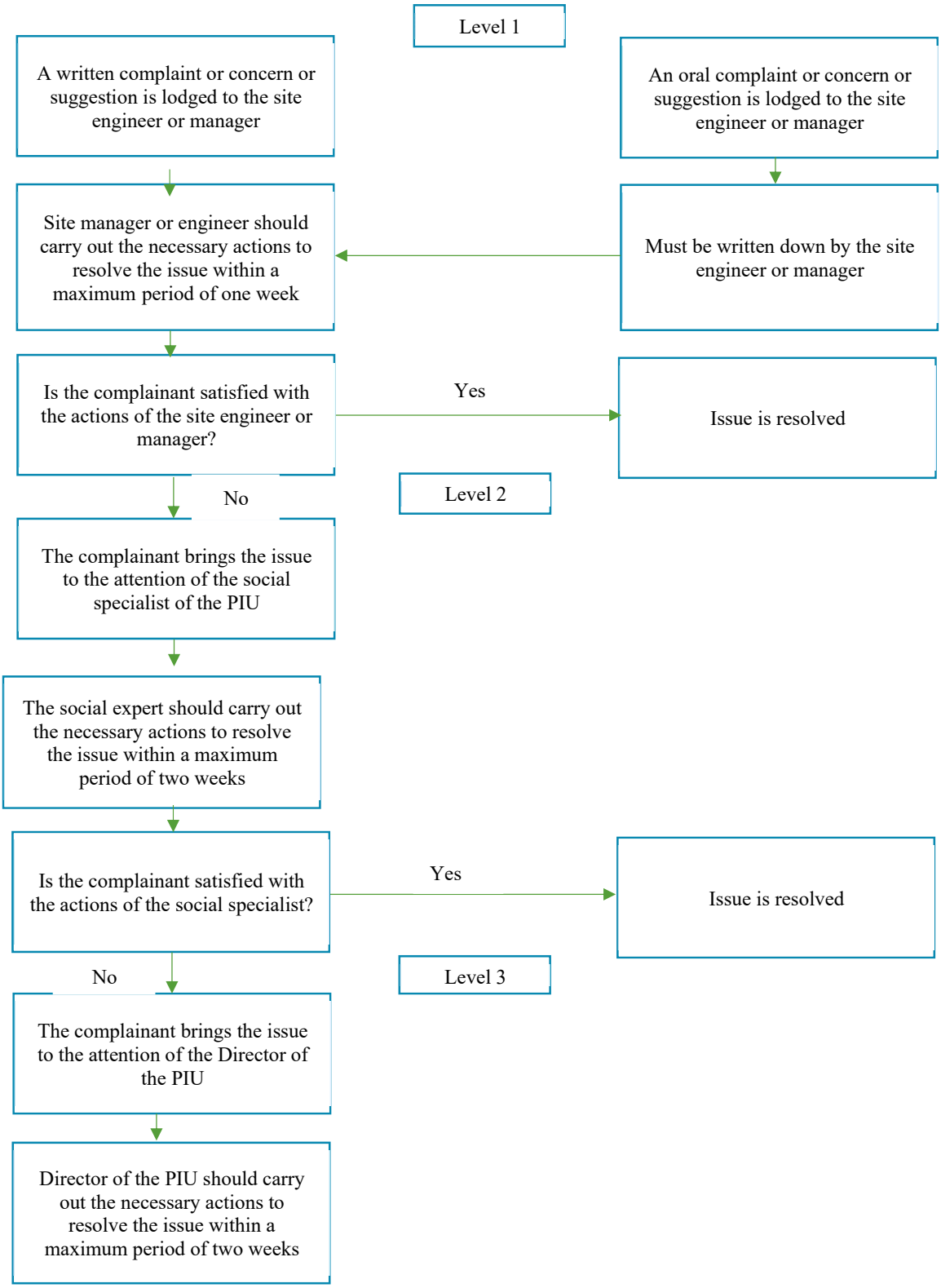
أنا الموقع أدناه، أقر بأني قرأت وتُليَ عَليَّ وفهمت وتلقيت الشرح والتدريب والمعلومات الكافية عن مدونة السلوك التابعة لمشروع الطرقات والعمالة. وأوافق على الامتثال للمعايير الواردة فيها وأعرف أن أي إجراء يتعارض مع مدونة السلوك هذه قد يؤدي إلى اتخاذ إجراء تأديبي وقد يؤثر على استمرارية عملي ضمن مشروع الطرقات والعمالة.

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

☐ العامل يجيد القراءة، وقد دوّن اسمه وإمضاءه

☐ العامل لا يجيد القراءة، وقد تُليَت عليه مدونة السلوك وتمّ الامضاء نيابةً عنه من قبل الأخصائي الاجتماعي

14 Annex5: Schematic illustration of the GRM



15 Annex 6: Complaint Register Form

Table R Complaints Registration Form

Name (optional), 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

16 Annex 7: 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 minimizing 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

17 Annex 8: Public Consultation

Municipalities and NGOs were consulted at this phase of the project. Consulted NGOs were targeted according to their position in Lebanon. They consist of two levels as follows:

a) Local NGOs: they are specific to each Caza. Their mission is to address different concerns and issues among the local society including social, economic, gender equality, environment, poverty, women empowerment, etc. The name of the invited NGOs and their field of activity are presented in the table below. Those local NGOs may play a role of advocates to reduce projects' social and environmental risks. Out of the invited local NGOs, only YASA attended the meeting.
b) International NGOs: they are covering the whole country and their consultation will be applied to all the ESMPs of the REP. They provide relief and developmental aid to many developing countries. They support the society in responding to crises and helps people whose lives and livelihoods are shattered by conflict and disaster to survive, recover and gain control of their future. When the crisis in Syria erupted in early 2011, numerous International NGOs responded to the humanitarian crisis and worked directly with the Syrian in Lebanon by providing aid and responding to their critical situation. In this context, Syrian refugees were contacted through the International NGOs to seek their feedback about the Project. Accordingly, this ESMP did not receive any concern about the Project.

Table S Consulted Local NGOs and their Activities

Organization	Activities
Auberge Beity association	Beity Association is a civil non-governmental & non-profit organization established in 2004 focusing on sustainable social and economic development through capacity building and empowerment of local communities, especially of children, youth, and women.
Women in Front	Created in 2012, "Women in Front" aims at empowering women and increasing their participation in political and public life
Amel Association	Since its creation, in 1979, Amel has opened field hospitals, maternities, development and medical centers in addition to cooperatives in several areas, regardless of their political or religious affiliations. As part of its support to refugee's program, it provides humanitarian aid to refugee communities, irrelevant of nationality. across the entire country.
Frontiers' Rights (Rouwad Houkouk)	Ruwad was founded in 2014 after long years of advocacy work launched by its activists in 1999. The association defends the fundamental rights of marginalized groups in Lebanon, focusing on three areas: statelessness, right to asylum, and right to personal freedom, safety and non-refoulement (non-forced return to home country).

Table T Consulted International NGOs and their Activities

NGO Name	Intervention Sector(s)
ANERA Lebanon	• Children & Youth • Development • Education • Relief Services • Water sanitation and hygiene
ACTED	• Development • Infrastructure & Services Rehabilitation • Labor & Livelihoods • Shelter • Water sanitation and hygiene
Danish Refugee Council (DRC)	• Direct Assistance • Protection • Shelter • Community Empowerment and Livelihoods

Photos: Kesrouane Caza- Inclusive public participation meeting

Public Participation meeting (July 2023)

Invitation letter:

TIVÈL Consultancy
Cell. : +961-76 788843
1st floor-Ghaleb Center-Slayeb
Zgharta, Lebanon
Registry No. 3017068

TIVÈL

الموضوع: دعوة لحضور إجتماع مشاركة عامة حول مشروع "الطرق والعمالة"

تحية طيبة وبعد،

بما أن مجلس الإنماء والإعمار يقوم بتمويل من البنك الدولي بتنفيذ مشروع "الطرق والعمالة" لتأهيل وصيانة الطرق في جميع المحافظات اللبنانية، بإستثناء محافظة بيروت؛

ولما كانت شركة دار الهندسة نزيه طالب وشركاه قد تكلفت من قبل مجلس الإنماء والإعمار للقيام بالدراسات الهندسية والبيئية المتعلقة بالمشروع والتي بدورها كلّفت شركة **TIVÈL** للإستشارات البيئية بإعداد خطة إدارة بيئية وإجتماعية للمشروع المذكور؛

وحيث أنه من الضروري عقد اجتماعات تشاورية مع الجهات المعنية والعامة بشؤون البيئة والأمور الإجتماعية ذات الصلة بمشاريع الطرق والإستماع إلى آرائهم المتعلقة بالمشروع؛

وبما أن المشروع يهدف للقيام بأعمال صيانة لطرق دولية ورئيسية وثانوية في قضاء كسروان؛

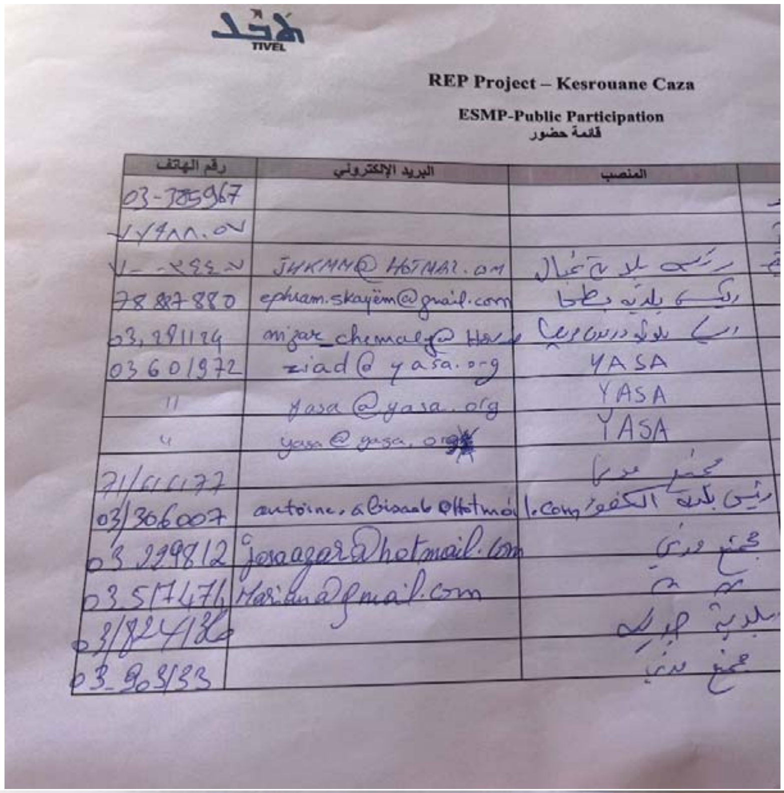
لذلك،

ندعوكم لحضور إجتماع مشاركة للعامة في تمام الساعة الحادية عشر صباحاً من يوم الجمعة الواقع في ٢٨ تموز في مبنى بلدية جونيه ؛ ونتمنى على المواطنين الكرام، إبداء الملاحظات الخطيّة، في حال وجودها، حول المشروع المذكور، وإرسالها إلى شركة دار الهندسة نزيه طالب وشركاه بواسطة الفاكس على الرقم التالي 01/863434 أو إيداعها في مبنى بلدية جونيه .

وتفضلوا بقبول فائق الاحترام
مديرة شركة TIVÈL
نسرين غزال معوض

TIVÈL

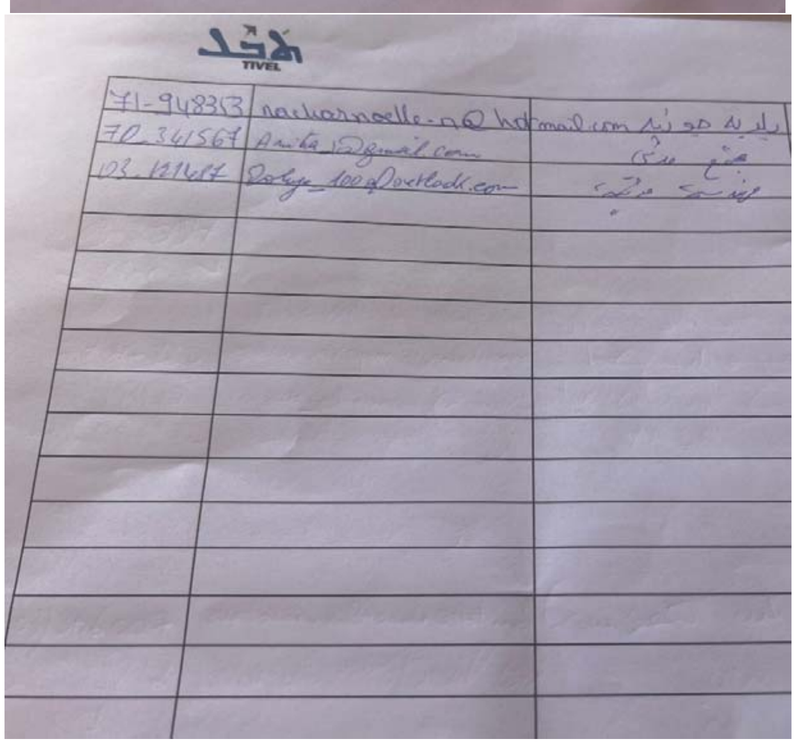
Attendance sheet:



REP Project – Kesrouane Caza

ESMP-Public Participation
قائمة حضور

رقم الهاتف	البريد الإلكتروني	المنصب
03-785967		
٧١٧٩٨٨٠٥٧		
[illegible]	JHKMN@HOTMAIL.com	رئيس بلدية [illegible]
78 887 880	ephram.skayem@gmail.com	رئيس بلدية [illegible]
03/[illegible]	nizar_chemaly@Hot[illegible]	رئيس بلدية [illegible]
03 601972	ziad@yasa.org	YASA
"	yasa@yasa.org	YASA
"	yasa@yasa.org	YASA
71/[illegible]		[illegible]
03/306007	antoine.abisaab@hotmail.com	رئيس بلدية الكفور
03 229812	josaazar@hotmail.com	مجتمع مدني
03 517471	[illegible]@gmail.com	[illegible]
03/824136		بلدية [illegible]
03 963133		مجتمع مدني



71-948353	nacharnoelle-n@hotmail.com	بلدية [illegible]
70-341567	Anita [illegible]@gmail.com	مجتمع مدني
03-121687	[illegible]100@outlook.com	[illegible]

PowerPoint Presentation:


نقاط حوار الجلسة

1. المقدمة
2. أهداف اللقاء
3. الجهات المعنية بالمشروع
4. مراحل إعداد خطة الإدارة البيئية والإجتماعية
5. وصف المشروع
6. دراسة المحيط البيئي (الوضع الحالي)
7. الآثار البيئية والاجتماعية الإيجابية للمشروع
8. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع
9. خطة الإدارة البيئية والإجتماعية
10. آلية مراجعة التذكرى GRM
11. منصة مشاركة المواطن
12. أسئلة ومناقشة عامة


مشروع الطرق والعمالة في لبنان

خطة الإدارة البيئية والاجتماعية

قضاء كسروان

جلسة مشاركة العامة

TIVEL

DAR AL HANDASAH NAZIH TALEB & PARTNERS


1. مقدمة

تتمتع شبكة الطرق في لبنان بنطاق وتغطية كافيين بشكل عام لكن نسبة كبيرة من تلك الطرق في حالة سيئة وهو الأمر الذي يؤدي إلى إعاقة التنمية المحلية والاقتصادية

مشروع الطرق والعمالة

- ينفذ مجلس الانماء والاعمار مشروع الطرق والعمالة في لبنان وذلك بالتنسيق مع وزارة الأشغال العامة والنقل عبر تمويل من البنك الدولي
- يشمل المشروع أعمال صيانة عدة طرق في بلدات من كافة الأقضية اللبنانية
- يهدف المشروع إلى تحسين شبكات النقل البري على امتداد أجزاء مُحدّدة مختارة من الطرق المصنفة في لبنان، و إلى تحفيز الاقتصاد من خلال خلق فرص العمل.


2. أهداف اللقاء

تحقيق الشفافية عبر إعلام الرأي العام بالمشروع لإبداء ملاحظاتهم وذلك وفقاً لسياسة ضمانات البنك الدولي (سياسة تشغيلية رقم 4.01)

عرض لأهم الاثار البيئية والاجتماعية والتدابير التخفيفية المرتبطة بتنفيذ المشروع

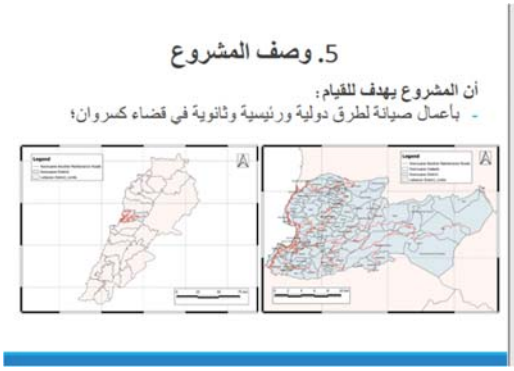
مناقشة خطة الإدارة البيئية والإجتماعية للمشروع التي تهدف لحماية الصحة البشرية، السلامة العامة والموارد البيئية


3. الجهات المعنية بالمشروع

الجهة	الصفة
البنك الدولي	ممول المشروع
مجلس الانماء والاعمار	إدارة وتنفيذ
دار الهندسة نزيه طالب وشركاه	استشاري هندسي
TIVÈL	استشاري بيئي


4. مراحل إعداد خطة الإدارة البيئية والإجتماعية

- تحديد الأطر السياسية والأطر القانونية للمشروع
- دراسة مكونات المشروع
- دراسة البيئة المحيطة
- تقييم الآثار المحتملة للمشروع
- مشاركة العامة
- تحديد الإجراءات التخفيفية لهذه الاثار وسبل لمراقبتها


5. وصف المشروع

أن المشروع يهدف للقيام:

- بأعمال صيانة لطرق دولية ورئيسية وثانوية في قضاء كسروان؛


5. وصف المشروع

- حواجز السلامة
- مجاري المياه
- الجسور والعبارات الصندوقية (Culvert box)
- اللوحات الإرشادية والخطوط المرورية والعلامات
- طبقات الرصف الإسفلتية (مستويات الأضرار ومدى انتشارها)

ماذا يتضمن المشروع خلال مرحلة التنفيذ؟

2. الصيانه الوقائيه والتي تعمل على إطالة العمر الإفتراضي للطريق وتتم به الاعمال التالية

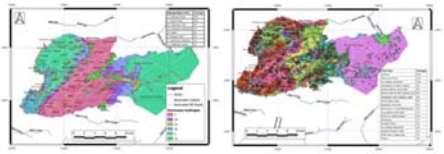
- تغطية سطح الطريق بطبقات جديده.
- إستبدال الطبقات الأسفلتيه سواء بإعاده رصفها أو بإزالتها تماماً وإعاده إنشائها تبعاً لحالة الرصف.
- إعاده إنشاء بعض أجزاء الطريق التي إنهارت طبقة القاعده تحتها.
- تركيب عبارات إضافية للصرف
- إصلاح العبارات الصندوقية (Culvert box) لإزالة الأضرار الناتجه عن السيول

ماذا يتضمن المشروع خلال مرحلة التنفيذ؟

1. الصيانه العاديه

- تنظيف الطريق .
- تعبئة التشققات وإصلاح العيوب البسيطة الموجوده على سطح الطريق.
- إصلاح الأكتاف والميول الجانبيه للطريق.
- تنظيف منشآت تصريف مياه الأمطار والقيام بالإصلاحات البسيطة اللازمة للمنشآت الخرسانية.
- فحص وصيانة وإصلاح حواجز السلامة.
- إصلاح أو إستبدال إشارات الطرق ودهان الطريق.
- الإهتمام بنظافة وتشكيل حدود حرم الطريق.

6. دراسة المحيط البيني (الوضع الحالي)



6. دراسة المحيط البيني (الوضع الحالي)

- نوعية الهواء
- نوعية التربة والمياه السطحية والجوفية
- الوضع الجيولوجي والهيدروجيولوجي
- التنوع البيولوجي
- التلوث الضوضائي
- الوضع الاجتماعي والاقتصادي للمنطقة

8. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التنفيذ

الآثار المحتملة على المجتمع	التدابير التخفيفية
تغير في حركة السير	• التخطيط والتشغيل السليمين للتحويلات المرورية • إعادة تأهيل الطريق بشكل تدريجي • وضع علامات سير وأنظمة إضاءة في الأماكن الحساسة لضمان سلامة النقل • Traffic Management Plan
خطر على الصحة والسلامة المهنية والعامة (في حال حصول أي حادث)	• تطوير خطة للتأكد من إلتزام المقاولين بالمبادئ التوجيهية للصحة والسلامة المهنية (OHS) • توفير المعدات المناسبة للحماية الشخصية • توفير التدريب على الصحة والسلامة المهنية للعمال • Hazard Communication

8. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التنفيذ

الآثار المحتملة على البيئة	التدابير التخفيفية
تلوث التربة	• التأكد من صيانة المركبات والمعدات ومن عدم وجود أي تسرب للوقود • توفير أطقم في الموقع لمعالجة أي انسكاب عرضي على الفور • تعيين مسؤولين عن الممارسات الجيده في الموقع بما في ذلك العلاج السريع لأي انسكاب عرضي
إنشاء المخلفات الصلبة	• تدريب الموظفين على إداره النفايات • إزالة المخلفات الصلبة من الموقع خلال 24 ساعة، والتخلص منها في مكبات قانونية محدده.

9. خطة الإدارة البيئية والإجتماعية

هدف الخطة الادارة البيئية والإجتماعية: مراقبة المشروع والتأكد من مطابقته مع جميع المعايير البيئية والإجتماعية.

بعد دراسة الاثار المحتملة للمشروع ،تقوم الدراسة باقتراح اساليب تخفيفية لهذه الاثار وسبل لمراقبتها.

خطة الادارة البيئية والإجتماعية تتضمن:

- مراقبة نوعية المياه
- مراقبة نوعية التربة
- مراقبة نوعية الهواء
- مراقبة نوعية التنوع البيولوجي
- مراقبة عملية التوظيف + Work conditions
- مراقبة الصحة والسلامة العامة
- خطة طوارئ في حال حدوث اي حادث مفاجئ.

8. الآثار البيئية والاجتماعية السلبية المحتملة للمشروع خلال مرحلة التنفيذ

الآثار المحتملة على المجتمع	التدابير التخفيفية
تأثر الحركة التجارية للمؤسسات والمحال القائمة على جانبي الطريق	• تسريع العمل من خلال الوضع والالتزام بأهداف ومقاييس واضحة لتقييم الأداء ومتابعة سير العمل • إعادة تأهيل الطريق بشكل تدريجي
Labor induced Sexual Exploitation and Abuse الاستغلال الجنسي والاعتداء الجنسي	• Awareness/Training, CoC, Sanctions • آلية مراجعة الشكاوىGRM
الضوضاء	• حصر الأعمال في ساعة محددة ومصرح عنها سابقاً • الحد من إستخدام الأجهزة والمعدات التي تسبب الضوضاء خصوصاً بالقرب من المنشآت الحساسة

10. آلية مراجعة الشكاوىGRM

يمكن للاشخاص المعنيين الاستفسار عن معلومات اضافية أو/و تقديم أية شكوى (في حال وجودها) بالتواصل مع وحدة آلية مراجعة الشكاوى من الاثنين حتى الجمعة بين 9:00 صباحاً و15:00 بعد الظهر، عبر :

1. الهاتف: 01980096 مقسم 317
2. البريد الالكتروني: GRM.REP@cdr.gov.lb
3. تسجيل كتاب رسمي لدى مجلس الانماء والاعمار
(العنوان: تلة السراي - رياض الصلح، بيروت – لبنان)

11. منصة مشاركة المواطن

أثناء تنفيذ المشروع

يمكنك إبداء رأيك حول تنفيذ المشروع في منطقتك من خلال تعبئة النموذج الموجود عبر الرابط
https://cdr.impact.gov.lb/worldbankmobile/home/main?langu=ar
سيكون رأيك مجهول المصدر

12. أسئلة ومناقشة عامة

يمكنكم إبداء رأيكم
عبر التواصل مع شركة TIVÈL
هاتف:+961 76 788 843
أو عبر التواصل مع وحدة مشروع الطرق والعمالة في مجلس الانماء والاعمار
هاتف: +961 1 980 096
بريد الكتروني: rep.grm@cdr.gov.lb

شكـــــراً لحضوركم ومشاركتكم

Request Letters sent by Municipalities

Letter 1 – Ghabala Municipality

الرقم العربي: 21 28 0 24

DAR AL HANDASAH NAZIH TALEB & PARTNERS
RECEIVED
31 JUL 2023
BEIRUT
SERIAL NO. 35780 FILE NO. L2102Dg
CL: N.H

الجمهورية اللبنانية
محافظة جبل لبنان
قائمقامية كسروان
بلدية غبالة
ص/ ف/ نمرة: 09/860750

عدد: 2023/121

السادة شركة دار الهندسة نزيه طالب وشركاه

المستدعي : رئيس بلدية غبالة فتوح كسروان

الموضوع : شرح اوضاع شبكة الطرق في بلدة غبالة وجوارها (مشروع الطرق والعمالة).

حضرة السادة شركة دار الهندسة نزيه طالب وشركاه لما كان مجلس الانماء والاعمار قد كلف شركتكم الموقرة للقيام بالدراسات الهندسية والبيئية المتعلقة بمشروع الطرق والعمالة لتأهيل وصيانة الطرق في قضاء كسروان (بتمويل من البنك الدولي) .

جئت بكتابي هذا عارضا لجانبكم اوضاع الطرق في بلدة غبالة التي هي بحالة غير مقبولة ويرثى لها كونها مليئة بالحفر ومنذ اكثر من عشرة سنوات لم تحصل البلدة على اي كمية من الزفت لتأهيل هذه الطرقات.

وبالنسبة للطريق العام في قرى الغينه جورة الترمس غبالة والعذرا هي غير صالحة للسير الا بصعوبة وبحاجة لاعادة التاهيل.

ام بالنسبة للطريق العام الذي يربط مابين كسروان والفتوح من بلدة وطى الجوز وحتى بلدة جورة الترمس مرورا بالمشاتي قبر الذهب حدشات وغبالة وفي محلة بحارة (غبالة) الطريق غير صالحة للسير الا بصعوبة مما يشكل خطرا على السائقين وضررا للسيارات وان القسم من الطريق الذي بحاجة للترميم هو بطول حوالي 20 متر وبعرض حوالي الاربعة امتار .

فلذلك اطلب من جانبكم الكشف على هذه الطرقات وادراجها ضمن دراستكم .

غبالة في 28 تموز 2023

رئيس بلدية غبالة

يوسف حبيب خيرالله

Letter 2 - Moaisra Municipality

الجمهورية اللبنانية

وزارة الداخلية والبلديات

محافظة جبل لبنان

بلدية المعيصرة

العدد : ٧٠/...

DAR AL HANDASAH NAZIH TALEB & PARTNERS
RECEIVED
25 JUL 2023
BEIRUT
SERIAL NO 35766 FILE NO L21a2Dg

cc: NH.

<u>جانب دار الهندسة نزيه طالب وشركاه</u>

تحية طيبة وبعد

- بتاريخ 2022/11/23 وجهت بلدية المعيصرة – كسروان كتابا الى جانب رئيس مجلس الانماء والاعمار الاستاذ نبيل الجسر سجل تحت الرقم 7203/ م . ر يتضمن طلب تزفيت الطريق الرئيسي للمدخل الشمالي لمنطقة – فتوح كسروان

- بتاريخ 2022/12/29 وردنا رد على كتابنا المشار اليه اعلاه من مجلس الانماء والاعمار حمل الرقم 2997 / 1 حيث افادونا بانه تعذر الاستجابة على طلبنا كون الطريق المطلوب تزفيته غير مدرج ضمن لائحة الطرق التي وافق مجلس الوزراء على تأهيلها

- بتاريخ 2023/3/15 تم اعادة الملف من قبل البلدية مع كتاب موجه الى مجلس الانماء والاعمار يطلب من جانبهم لحظ هذا المشروع الحيوي والانمائي ضمن لائحة الطرق التي ستلحظ مجددا لتنال موافقة مجلس الوزراء وذلك للحاجة الماسة وللضرورات القصوى

- وبعد ورود الدعوة الموجهة الى بلديات كسروان بواسطة شركة TIVEL للاستشارات البيئية حيث ابلغنا بان جانب شركتكم الموقرة قد كلفت من قبل مجلس الانماء والاعمار للقيام بالدراسات الهندسية والبيئية المتعلقة بالمشروع ، وبما ان المشروع يهدف للقيام باعمال صيانة للطرق الدولية والرئيسية والثانوية في قضاء كسروان

لذلك

جئنا بكتابنا هذا راجين من حضرتكم لحظ هذه الطريق الرئيسية الحيوية لفتوح كسروان وفي حال تعذر عملية القلش الكامل من الاسفلت لهذه الطريق فلتكن صيانة متجزئة للاقسام المهترئة بشكل كامل

وتفضلوا بقبول فائق الاحترام

المعيصرة في 2023/07/24

<u>مرفق ربطا</u> : كامل الملف والخرائط والصور

<u>ارقام الهاتف :</u>

70/988057/ 71/ 324566/ 70 /709094

رئيس بلدية المعيصرة

زهير نزيه عمرو

الجمهورية اللبنانية

وزارة الداخلية والبلديات

محافظة جبل لبنان

بلدية المعيصرة

العدد :

مجلس الإنماء والإعمار
مكتب الرئاسة
القلم

حضرة رئيس مجلس الانماء والاعمار

الاستاذ نبيل الجسر المحترم

تحية طيبة وبعد

عطفاً على كتابكم الموجه الينا تحت الرقم 1/2997 بتاريخ 2023/01/29 والذي تبلغوننا به بأنه تعذر على مجلسكم الكريم الاستجابة لطلبنا "**تزفيت المدخل الشمالي لمنطقة فتوح كسروان ضمن مشروع الطرقات والعمالة في قضائي المتن وكسروان** " كون الطريق المطلوب تزفيته غير مدرج ضمن لائحة الطرق الذي وافق عليها مجلس الوزراء بموجب قراره رقم 1 تاريخ 2029/9/27

لذلك

نعيد اليكم كامل الملف ونرجو من مجلسكم الكريم لحظ هذا المشروع الحيوي والانمائي من ضمن لائحة الطرق التي ستلحظ مجددا لنذل موافقة مجلس الوزراء وذلك للحاجة الماسة وللضرورات القصوى

وتفضلوا بقبول فائق الاحترام

المعيصرة في 2023/03/15

رئيس بلدية المعيصرة

زاهر نزيه عمرو

ارقام الهاتف :

70/709094

70/988057

71/324566

مجلس الإنماء والإعمار
بيروت - لبنان

الرقم : ١/٢٩٩٧ حضرة رئيس بلدية المعيصرة بيروت في ٢٠٢٢/١٢/٢٩
السيد زهير نزيه عمرو المحترم

الموضوع: طلبكم تزفيت المدخل الشمالي لمنطقة فتوح كسروان ضمن مشروع الطرقات والعمالة في قضاءي المتن وكسروان.

المرجع: كتابكم المسجل لدى مجلس الإنماء والإعمار تحت الرقم ٧٢٠٣/م.ر. تاريخ ٢٠٢٢/١١/٢٩.

بالإشارة الى الموضوع والمرجع المبينين أعلاه،

وحيث انه تطلبون بموجب كتابكم المشار إليه في المرجع أعلاه تزفيت المدخل الشمالي لمنطقة فتوح كسروان ضمن مشروع الطرقات والعمالة في قضاءي المتن وكسروان،

نفيدكم عن تعذر مجلس الإنماء والإعمار الاستجابة لطلبكم المنوه عنه أعلاه، كون ان الطريق الذي تطلبون تزفيته (المدخل الشمالي لمنطقة فتوح كسروان) غير مدرج ضمن لائحة الطرق التي وافق مجلس الوزراء على تأهيلها بموجب قراره رقم ١ تاريخ ٢٠١٩/٦/٢٧.

وتفضلوا بقبول فائق الاحترام.

رئيس مجلس الانماء والاعمار
نبيل عدنان الجسر

الجمهورية اللبنانية

وزارة الداخلية والبلديات

محافظة جبل لبنان

بلدية المعيصرة

العدد : ١٨٨/ص

مجلس الإنماء والإعمار

جانب مجلس الانماء والاعمار المحترمين

المستدعى : بلدية المعيصرة – قضاء كسروان

الموضوع : طلب تزفيت الطريق الرئيسي للمدخل الشمالي لمنطقة - فتوح كسروان

يمتد مدخل فتوح كسروان الشمالي من الاوتستراد الدولي لمنطقة العقيبة بطول 500 متر مروراً ببلدة قوالة- زيتون بطول 1500 متر وصولاً الى بلدة المعيصرة بطول 3100 متر اي بطول إجمالي 5100 متر وبعرض 10 أمتار لكامل الطريق

إن هذا الطريق يعتبر المدخل الرئيسي لمنطقة فتوح كسروان والشريان الحيوي لكافة البلدات ويصل الى الاوتستراد الذي يتم تنفيذه حالياً من منطقة العذرا – جورة بدران – جورة الترمس – وطى الجوز وصولاً الى اوتستراد ميروبا ، حيث تصبح هذه الطرقات مرتبطة بعضها ببعض ، وإن هذا الطريق لا يحتاج الا الى برش الزفت (miling) وكولاس وزفت فقط كون قالب هذا الطريق كما هو مبين بالصور المرفقة ربطاً لا يحتاج الى اي تسوية كما توجد حيطان دعم للحفاظ على السلامة العامة

إن هذا المشروع يعتبر مشروعاً استراتيجياً لمنطقة فتوح كسروان

لذلك

نرجو من حضرتكم الحاق هذا المشروع اسوة بالمشاريع التي تنفذ من مجلس الانماء والاعمار بتمويل من البنك الدولي لضرورته الاستراتجية للمنطقة

مرفق ربطاً :

مصور عن الخرائط

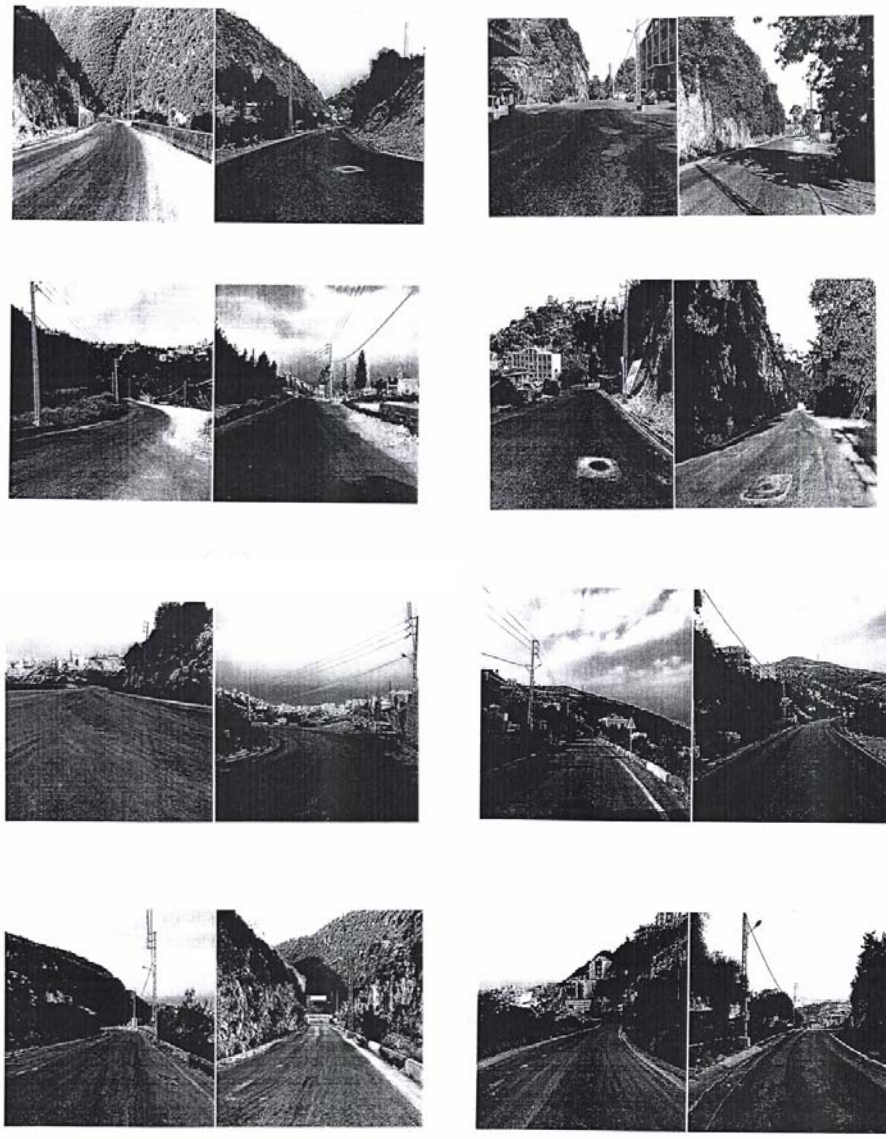
صور فوتوغرافية للطريق

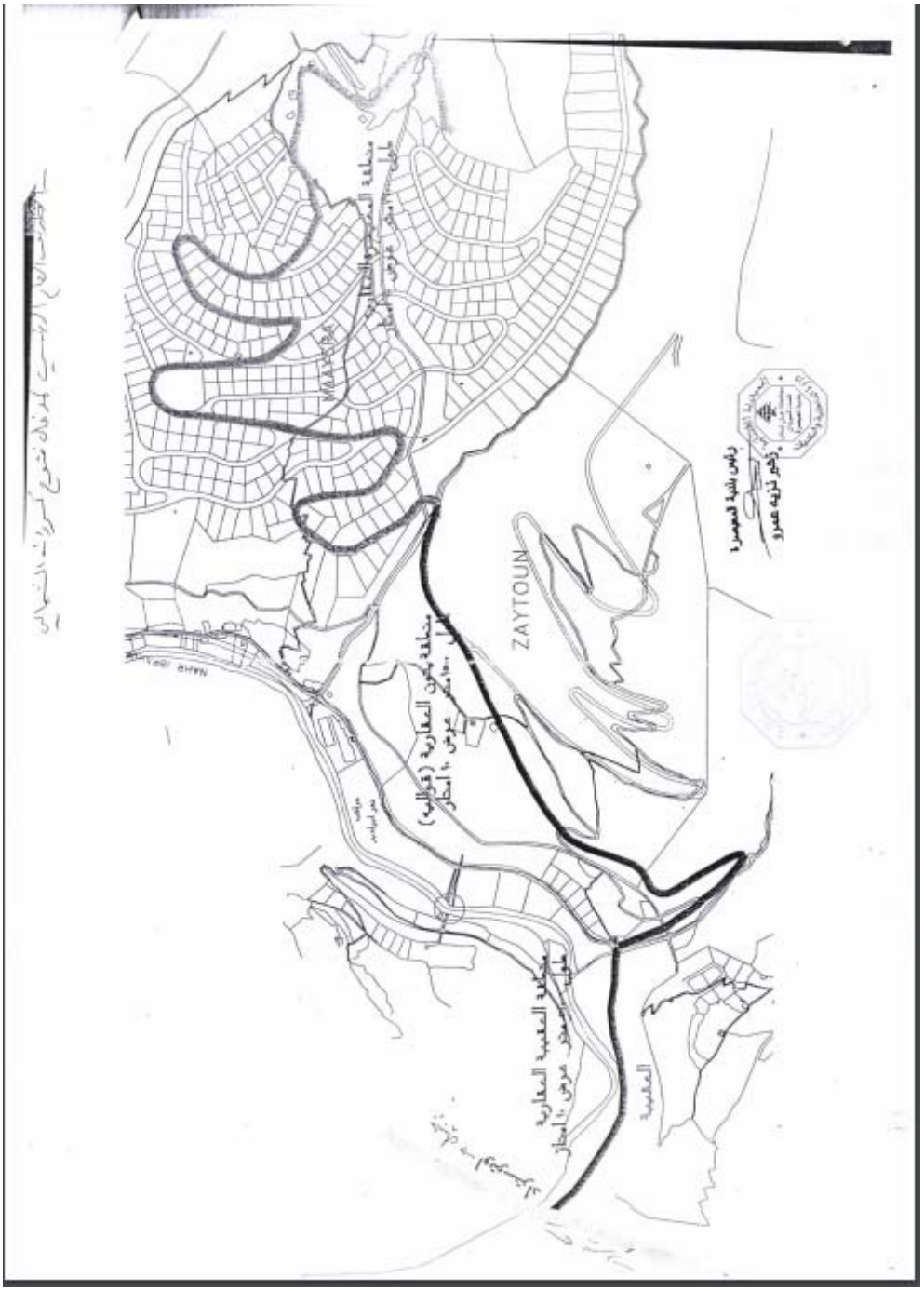
وتفضلوا بقبول فائق الاحترام

المعيصرة في 2022/11/23

رئيس بلدية المعيصرة

زهير نزيه عمرو




ZAYTOUN
العقيبة

مجلس الانماء والاعمار

مستند احالة داخلي

رقم التسجيل : 7203 — تاريخ الورود : 2-11-29.

☑ المصدر ☐ المرسل اليه — بلدية المعيصرة — تاريخ الوثيقة : 022-11-23.

☑ بريد ☐ فاكس | ☑ وارد خارجي ☐ وارد داخلي | ☐ صادر خارجي ☐ صادر داخلي

	التوزيع	[illegible]	[illegible]	مرفقات		الاعمال المطلوبة					احالات / ملاحظات
1	رئيس المجلس										
2	اعضاء المكتب										
3	مفوض الحكومة										
4	مجلس الادارة ☐ اعضاء ☐ لجنة										
5	ادارة الشؤون الادارية										
6	ادارة التمويل										
7	ادارة الشؤون القانونية										
8	ادارة التخطيط والبرمجة										
9	ادارة المشاريع	x				X					
10	الادارة المالية										
11	لجنة ☐ التقييم ☐ الاستلام										
12	ESFD										
13	الملف المركزي		x								
14	مكتب الرئيس										
15	مدير مكتب الرئاسة										
16	المكتب الاعلامي										
30	موظف المعلومات										
18											
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ملاحظات :

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الجمهورية اللبنانية - مجلس الانماء والاعمار

FTabib 29.11.2022