



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

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



**ENVIRONMENTAL & SOCIAL
MANAGEMENT PLAN REPORT
FOR**

**ROADS ROUTINE MAINTENANCE
(BAALBEK CAZA)**

March 2024

EXECUTIVE SUMMARY

INTRODUCTION

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

PROJECT DESCRIPTION

The REP consists of the maintenance activities to be performed during the project, that vary between one road and the other, depending on the road rating in terms of the condition of the pavement, shoulders, potential flooding and drainage, potential landslide/soil erosion and retaining walls, pedestrian walkways. Routine Maintenance activities will be executed for a period of six months, for Baalbek Caza, for Primary roads as priority and for Secondary roads where funds are available. This report will further study the Baalbek Caza.

The land acquisition did not occur during the design of any road under study. In the Baalbek district, five primary roads are proposed, whose details are elaborated within the ESMP. There will be no land acquisition in any stage of the project. Project works will only be in public domain.

During the execution of maintenance activities, roads will not be closed or shutdown. However, if there is any need for temporary diversion, traffic management will be prepared and the Contractor will secure the access and traffic movement via other alternative routes (if needed) and means in coordination with the related Municipality, to ensure that access to the communities during the maintenance works will not be closed. The duration of the project is 6 months. This duration will be for the maintenance of all the roads. It is assumed as indicative number only that an estimate total number of workers shall range between 20 and 30 labors, 2 Forman, 2 Engineers and 2 skilled drivers on daily basis. These workers must be hired preferably from the same Caza (including Syrian labors that reside in the concerned project areas).

BASELINE ASSESSMENT

The environmental and social assessment recorded the existing conditions within the project area including physical, biological, and socioeconomic conditions prior the project implementation and operation. Baseline data and field surveys were conducted to describe the

status of the following environmental receptors: air quality, water quality, soil quality, geological conditions, climate and meteorology, natural habitats and biodiversity, land-use/land-cover, acoustic environment, cultural resources, and socio-economic conditions (employment opportunities, labor influx, social tensions, labor induced Sexual Exploitation and Abuse (SEA) Sexual Harassment (SH), Occupational Health and Safety (OHS).

The topography shows that the five proposed roads in the Baalbek Caza are:

1. **Primary Road-01 (7.69 km):** from Ras Baalbek (at the intersection between Baalbek-Qaa Highway and Hermel-Ras Baalbek Road), to Ras Al Assi. The elevations range from 802m to 732 m, respectively.
2. **Primary road -02 (64.3 km):** from Tamnine El Faouqa at an elevation of 993 m to Ainata (Arez-Baalbek Road) at an elevation of 1420 m.
3. **Primary road -03 (15.1 km):** from Chlifa (Arez-Baalbek Road) at an elevation of 993 m to Douris at an elevation of 1117 m.
4. **Primary road -04 (17.4 km):** from Hadath Baalbek at an elevation of 1104 m to Slouqi at an elevation of 1282 m.
5. **Primary road -05 (16.6 km):** from Nabi Rached at an elevation of 1118 m to Brital at an elevation of 1292 m.

The geology of the studied roads was investigated for outcropping formations, subsurface stratigraphy, structure (faults, folds, seismic, etc.), hydrogeology (groundwater and sea water intrusions) and hydrology (surface water). Assessments indicate that the outcropping geological formation under Baalbek road are not highly permeable which leads to a lower groundwater contamination risk. On the other hand, the underlying karstic formation is more susceptible to contamination due to its high permeable nature. In terms of surface water quality, the roads are in close proximity to Al Assi Perennial River.

The climate and meteorological parameters play an important role in the transport and dispersion of pollutants in the atmosphere. Precipitation is negligible in the summer season between the months of June and September; the highest precipitation is recorded in the month of February with an average value of 137 mm and the total annual precipitation is 631 mm. In addition, at high elevations, snow is common and is expected to affect maintenance activities. As for wind, dominant wind in the area is wind that blows from the West towards the East with speeds varying between 0.3 m/s and 8m/s. Additionally, as for temperature, the lowest are recorded in January (average at 1° C) and the highest in August (average at 30.4° C). Thus, the impact of the climate on the roads and the traffic flow will be moderate to negligible, with no flash foods nor damage to roads' infrastructure.

Data regarding air pollution levels in the area was also obtained. The study showed that the major air pollutants induced by traffic include Carbon monoxide (CO), Nitrogen Oxides (NOx), Sulfur oxides (SOx), Hydrocarbons (HC), and Particulate matter (PM). These pollutants are associated with potential adverse health impacts with long-term exposure to atmospheric concentrations exceeding threshold limits. Data were obtained from data gathered from the MOE/ UNDP project, 'Air quality assessment in an East Mediterranean country: the case of Lebanon, 2014' which monitored criteria air pollutants. The study showed that the

concentrations collected by the MoE stations for all criteria air pollutants in 2018 for the studied area are within the national ambient air quality standards defined by MOE Decision 16/1.

Regarding natural habitats and biodiversity, given the nature of the project, the direct influence area concerns existing roads. Consequently, a rapid biological assessment has been carried out to draw the ecological profile of the adjacent areas to the concerned roads. The field investigation did not aim for an exhaustive inventory of the biodiversity of the project area but a general overview of present species (mainly flora) and habitats. The studied roads involve a path that is already under anthropogenic influences. The roads are mainly bordered by human settlements and agricultural lands. The assessment showed that the main encountered socio-economical activities that are adjacent to the studied roads are mainly commercial units (restaurants, gas stations, clothing stores, pharmacies etc.), residential areas, places of worship (mosques and churches), schools, agricultural lands (agricultural terraces, fallow lands, cultivated trees) in addition to unproductive areas (vacant lands). In this context, the area does not provide an important habitat for a large variety of flora and fauna, because it is highly degraded due to human activities surrounding the roads.

Finally, a socio-economic assessment (desk study) was conducted in the project area to map the demographic, social, and economic baseline conditions at the level of Baalbek Caza. A set of social indicators were investigated including Baalbek's demographic profile (age and gender distribution), employment and livelihood, the availability of public and private education and health institutions, the global level of education (educational attainment) and standards of public health, access to public utility and community services, land use patterns, archeology and cultural heritage, and impacts of the Syrian crisis.

The assessment allowed drawing conclusions regarding the project's potential impacts on the socio-economic conditions of the study area.

Hence, when considering the demographic profile of the study area, the population of all the villages in the Baalbek Caza is determined. In 2015, the total population in the Caza is 416,427. Baalbek city holds the largest human concentration in the area, with 93,000 inhabitants and a population density of 234 persons/hectare. Of the total resident population in Baalbek region, 5,117 are displaced Palestinian (UNHCR, 2015). 106,883 are registered Syrian refugees (UNHCR, 2023). In the Baalbek-El Hermel district, the total Lebanese population in need is 126,248, for displaced Syrians it is 200,124, and for Palestinian Refugees it is 4,264 (OCHA, 2023).

POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

The maintenance phase is known to have potential adverse impacts on several indicators including traffic, air quality, noise level, construction waste, water and soil quality, landscape and visual intrusion, resources consumption, damage to existing utilities, health, and safety, as well as socioeconomics. During the maintenance phase, these impacts are temporary with the majority being minor or moderately negative (Table I). During operation, the maintenance of the road, combined with the natural increase in the vehicle fleet size, will ultimately increase traffic volume and hence, typical impacts associated with increased traffic will be inevitable in the long term. Yet, improved traffic flow on maintained roads will lead to improved fuel

efficiency and better engine performance, thereby reducing vehicle emissions and maintenance. Maintained roads can lead to improved landscape and visual intrusion, albeit some increase in light glare. Finally, improved safety design of roads can reduce the potential for accidents. The magnitude and significance of these impacts is similar along the studied roads.

Table I. Summary of potential impacts of proposed roads in Baalbek district

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

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

ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

Mitigation Plans

While the road maintenance is associated with some potential negative impacts, most of them are temporary and can be alleviated. Environmental and Social mitigation measures should be adopted to eliminate or minimize these impacts (refer to section 6.1).

Monitoring Plan

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

During the maintenance phase, the Supervising Consultant shall submit a monthly report about the works activities to the CDR. The content of a typical report should mirror the indicators of the mitigation plan with proper documentation with photos taken in the event of accidents, concerns or complaints.

CONSULTATION, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

Public Consultation

The public consultation is to inform the local authorities about the project and get their opinion in the project implementation.

Due to the project extent over the entire Caza, the union of municipalities is the party that will represent all concerned municipalities. The stakeholders are the concerned municipalities. As well, local concerned NGOs are to be informed with the project and a virtual meeting is to be planned to get their feedback. The stakeholders were made aware of consultation hearing through a public participation invitation sent to the union of municipalities of Baalbek (Invitation is presented in Annex 5, in the Invitation letters section).

A public consultation hearing was held on Thursday 24th of August, 2023 at the municipality building of Baalbek (with online connection made available to the public to connect remotely). During this hearing project details and design, impacts and mitigation measures were presented in a 35-minute presentation (see more details in Annex 5), which was followed by an open discussion with the attendees, which were the heads of the concerned municipalities. A total of 8 attendees were present during the public hearing, none of whom were women, because the heads of the concerned municipalities are men only. An online meeting (a second meeting) was held on Tuesday August 29, 2023 for local and public concerned NGOs who couldn't attend the public meeting, and 6 people were attending (three of whom were women). The main issues raised were about the selection of roads within the REP scope, the coordination with local authorities especially with respect to public works, and technical concerns.

Grievance Redress Mechanism (GRM)

A grievance redress mechanism (GRM) is in place to allow stakeholders to voice their concerns during the project phases: pre-construction, construction, and operation. The GRM is designed to allow a timely resolution of concerns, assuring stakeholders that grievances have been heard and that the institutionalized mechanism will yield a fair and impartial outcome. Furthermore, the grievance mechanism is applicable for both Lebanese and Syrian workers with the option to remain anonymous when filing a grievance to encourage workers to speak out without potential fear of repercussions.

REP GRM levels are as follows:

- 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 (immediate

investigation shall be carried out and corrective actions shall be taken in case of issues assessed as critical)).

- 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. The contact details are made available to the public by being presented on the project and mobile sign boards.
- 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. Citizens can also register an official letter at the CDR (Address: Tallet al Serail – Riad el Solh, Beirut – Lebanon).

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LIST OF ABBREVIATIONS

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

LIST OF NOMENCLATURES

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

1 INTRODUCTION

1.1 Project background

The Government of Lebanon (GOL) has solicited and obtained World Bank (WB) financing for the Roads and Employment Project (REP). The Council for Development and Reconstruction (CDR) is acting as the executing agency on behalf of the GOL and its Council of Ministers (COM). The REP was approved by the WB Board of Executive Directors in February 2017 and ratified by the Lebanese Parliament in October 2018. The REP seeks to improve transport connectivity along select paved road sections, create short-term employment opportunities for local communities (Lebanese and Syrians), and support farmers engaged in crop and livestock production.

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 Team International, which was assigned by CDR contract number 20379 aims to effectively address the environmental and social challenges linked to the envisaged routine maintenance activities that are confined within the alignments of existing roads with no road widening, in Baalbek Caza, primarily targeting the maintenance of primary roads as priority and for secondary roads where funds are available.

Therefore, under Lebanese regulations, the REP does not fall under either Annex I (projects requiring a full EIA) or Annex II (projects requiring an Initial Environmental Examination (IEE) of the EIA Decree No. 8633/2012 on the Fundamentals of Environmental Impact Assessment (EIA) in Lebanon. However, the REP triggered the World Bank Operational Policy

OP 4.01 requiring Environmental and Social assessment. As such the prepared Environmental and Social Safeguard report will be conducted for the roads within the Baalbek district (Caza) of the Baalbek-Hermel governorate (Mohafazah).

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 Baalbek-specific ESMP prepared by Team International covering roads that were selected by the Lebanese Government for full rehabilitation works (ESMP for Baalbek Caza is available on CDR Website via the following link:

https://www.cdr.gov.lb/CDR/media/CDR/StudiesandReports/Roads%20and%20Employment/Caza/Baalbek_Final-ESMP.pdf

To manage the environmental and social risks associated with the addition of routine maintenance activities in Baalbek Caza, primarily targeting the maintenance of primary roads as priority and for secondary roads, relevant mitigation measures as well as necessary institutional arrangements was covered through this specific ESMP Report.

This report represents the Environmental and Social Management Plan (ESMP) for Roads Routine Maintenance activities in Baalbek Caza in line with WB safeguard Operational Policies, guidelines and national legislation. Noting that the Project was signed before October 2018, date of effectiveness of the Environmental and Social Framework (ESF). It is worth mentioning that some roads under the REP are already under rehabilitation and that the roads under this ESMP are new roads eligible for maintenance.

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 Baalbek Caza was prepared by Team International 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 Baalbek 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 Baalbek 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

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

- Examine the national legislation and World Bank safeguard policies relevant to the project

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

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

2 LEGAL, INSTITUTIONAL, STANDARDS AND POLICIES FRAMEWORKS

2.1 Legal Framework

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

2.2 Institutional Framework

A summary of the role of all concerned public agencies is presented in Table 2-1 below. At this stage, it is expected that the proposed project will involve primarily the CDR. Since some proposed roads may pass near sensitive areas, close coordination with relevant ministries is also anticipated in the event any finds are made. At the completion of the project, the road becomes under the jurisdiction of the MoPWT for the purpose of maintenance whenever required.

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

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

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

<i>Legislation</i>	<i>Date of Issue</i>	<i>Subject</i>	<i>Relevance to the project</i>
<i>Environment-related legislation</i>			
<i>Law 80</i>	10/10/2018	Integrated solid waste management law	The requirements of the law shall be adhered to for the management of solid wastes generated from the project.
<i>Law 78</i>	13/04/2018	Law for the protection of air quality	The requirements of the law shall be adhered to for the management of air emissions from the project.
<i>Law 77</i>	13/04/2018	Water Resources Law	Penalizes unauthorized discharges or disposal of any kind of waste in water resources
<i>MOE Decree 8803/2002 and its amendments</i>	04/10/2002	Organizes the activity of quarries and crushers, licensing procedures, as well as the operation, management and maintenance of quarries	Ensures the provision of construction material and the disposal of construction waste comply with the decree
<i>Law 444</i>	29/7/2002	Environmental protection framework law, includes the general provisions for the protection of the environment	Ensures project activities are in line with the requirements of the Law, particularly the articles in Chapter 5 on the protection of environmental media (air, coast, water, noise, facilities, natural resources, etc.)
<i>MOE Decision 8/1</i>	30/1/2001	Updates Decision 1/52 and in setting of the National Standards for Environmental Quality by the MOE	Ensures project activities comply with national environmental standards
<i>MOE Decision 16/1</i>	10/02/2022	An updated limit values of the air emissions decision 8/1 dated 30/01/2001 for air emissions.	Air emissions generated by the project from waste management, recycling and treatment in the facility, must be monitored to meet the specific limit of values, in respect with this decision, as per annex 3.
<i>Law 558</i>	24/07/1996	Law for the protection of forests	The requirements of the law shall be adhered to for the protection of forests.
<i>Decree 2761</i>	19/12/1933	Guidelines related to wastewater management and disposal	Ensures waste management activity comply with the decree
<i>Decree Law 8735</i>	23/08/1974	Maintaining general cleanliness	Ensures project activities adhere to this decree particularly in terms of waste disposal
<i>MoE Decision 1/52</i>	12/09/1996	Setting the National Standards for Environmental Quality by MoE	Ensures project activities comply with National Environmental Standards
<i>Cultural heritage related legislation</i>			
<i>Decree law 166</i>	7/11/1933	Antiquity law	Defines chance find procedures that should be followed in case antiquities were identified in the project site
<i>Urban/ rural planning and construction-related legislation</i>			
<i>Law 58</i>	29/05/1991	Expropriation Law	Adhere to provisions in case the project requires expropriation.
<i>Law 118</i>	30/06/1977	Municipalities Law. It stipulates the role of the Municipalities and Municipalities councils.	Defines the roles of municipalities in the provision of environmental services such as solid waste management, wastewater management, etc.

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

2.3 Environmental Standards

The National emission levels for wastewater effluent, ambient noise and ambient air quality are provided in this section.

Wastewater Discharge Targets

The allowable contaminants concentration for wastewater when discharged into the sewage network, sea or surface water are indicated in the MoE decision 8/1 dated 30/1/2001. The table below shows a list of allowable contaminants concentrations.

Table 2-3 The allowable contaminants concentration for wastewater when discharged into different bodies

Contaminants	Surface Water	Sewage Network	Sea Water
pH	6 – 9	6 – 9	6 – 9
BOD mg/l	25	125	25
COD mg/l	125	500	125
temperature Co	30	35	35
Total nitrogen mg/l	30	60	30
Total phosphorus mg/l	10	10	10
Oil and grease mg/l	30	50	30
Mercury mg/l	0.05	0.05	0.05
Total suspended solids mg/l	60	600	60
Total coliform bacteria (Most Probable Number/100 ml)	2,000	-	2,000

Air Emissions Targets

The maximum allowable limits for outdoor air pollutants are specified in Annex 14 of the MoE Decision No. 16/1 dated 2022. The table below shows the list of allowable criteria pollutants concentrations.

Table 2-4 Maximum allowable limits for outdoor air pollutants

Pollutants	Maximum Limit ($\mu\text{g}/\text{m}^3$)	Exposure duration
Sulphur dioxide (SO_2)	350	1 hr
	120	24 hrs
	80	1 yr
Nitrogen dioxide (NO_2)	200	1 hr
	150	24 hrs
	100	1 yr
Ozone (O_3)	150	1 hr
	100	8 hrs
Carbon monoxide (CO)	30,000	1 hr
	10,000	8 hrs

Pollutants	Maximum Limit ($\mu\text{g}/\text{m}^3$)	Exposure duration
Total Suspended Particles (TSP)	120	24 hrs
PM ₁₀	80	24 hrs
Lead (Pb)	1	1 yr
Benzene	5 ppb	1 yr

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 2-5 Sound pressure limits according to 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 2-6 Noise exposure limits

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 2-7 Lebanese noise guidelines for different zones (MoE 52/1, 1996)

Area classification	Maximum accepted noise level dB(A)		
	Day ¹	Evening ²	Night ³
Commercial and administrative area in town centers	55 – 65	50 – 60	45 – 55
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
⁽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

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

2.4.1 Safeguard Policies

OP 4.01 Environmental Assessment.

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

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

OP 4.12 Involuntary Resettlement.

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

2.4.2 Access to Information (AI) policy

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

2.4.3 EHS guidelines

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

2.4.4 Consultation and Disclosure Policy

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

3 PROJECT DESCRIPTION

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

Annex 1 comprises maps of the roads' location and the surrounding villages and/or towns.

3.1 Location

A general layout of the selected roads for maintenance in the Baalbek Caza is presented in Figure 3-1. The location and coordinates of the proposed roads in addition to key characteristic features or potential sensitive receptors are presented in Table 3-1.

Table 3-1. Location and characteristics of Baalbek district proposed roads

Road code	Villages: From to	Coordinates		Classification	Length (Km)	Width range (m)	Elevation range (m)	Key features
		Start	End					
Primary Road-01	Ras Baalbek	34°17'55.96"N	34°21'41.12"N	Primary	7,69	5-7	802-	Few restaurants, vacant lands, few agricultural lands
	to Ras Al Assi	36°25'32.24"E	36°24'9.26"E				732	Scattered residencies and restaurants.
Primary Road-02	Tamnine El Faouqa	33°53'14.54"N	34°12'41.32"N	Primary	64.3	5-7	993-	Restaurants, residential units, gas stations, schools, agricultural lands
	to Ainata (Arez-Baalbek Road)	35°58'56.48"E	36°03'35.12"E				1420	Scattered residencies, Vacant lands, few agricultural lands.
Primary Road-03	Chlifa (Arez-Baalbek Road)	34°51'0.15"N	33°59'43.48"N	Primary	15.1	5-7	992-	Agricultural lands, vacant lands
	To Douris	36°7'28.26"E	36°10'48.33"E				1117	Residential units, few restaurants,
Primary Road-04	Hadeth Baalbek	33°59'47.88"N	34°0'25.15"N	Primary	17.4	5-7	1104-	Scattered residences, few agricultural lands
	to Slouqi	36°2'17.61"E	33°55'34.27"E				1282	Vacant lands
Primary Road-05	Nabi Rached	33°59'40.05"N	33°55'54.83"N	Primary	16.6	5-7	1118-	Agricultural lands, vacant lands.
	to Brital	36°2'11.51"E	36°11'12.27"E				1292	Residential units, vacant lands

The alignment of each road is stated below (see figure B in Annex 1 – administrative map):

- ❑ **Primary Road-01**, from Ras Baalbek (at the intersection between Baalbek-Qaa Highway and Hermel-Ras Baalbek Road) near Al Mhatta coffee shop, and stretches for 7,69km passes through Deir Mar Maroun Baalbek, reaches Ras Al Assi.
- ❑ **Primary Road-02**, starts from Tamnine El Faouqa and stretches for 64.3 km passing through Bednayel, Kfar Dabach, Hadeth, Deir Al Ahmar, reaching Ainata (Arez Baalbek road).
- ❑ **Primary Road-03**, starts from Chlifa (Arez-Baalbek Road), stretches for 15.1 km and ends at Douris.
- ❑ **Primary Road-04**, starts from Hadeth Baalbek and stretches for 17.4 km passing through Taraya and ends at Slouqi.
- ❑ **Primary Road-05**, starts from Nabi Rached and stretches for 16.6 km passing through Hizzine and ends at Brital

Still, depending on the quantities of maintenance works required to these selected primary roads, the remaining of funds and contract duration; other secondary selected roads may be included to this maintenance.

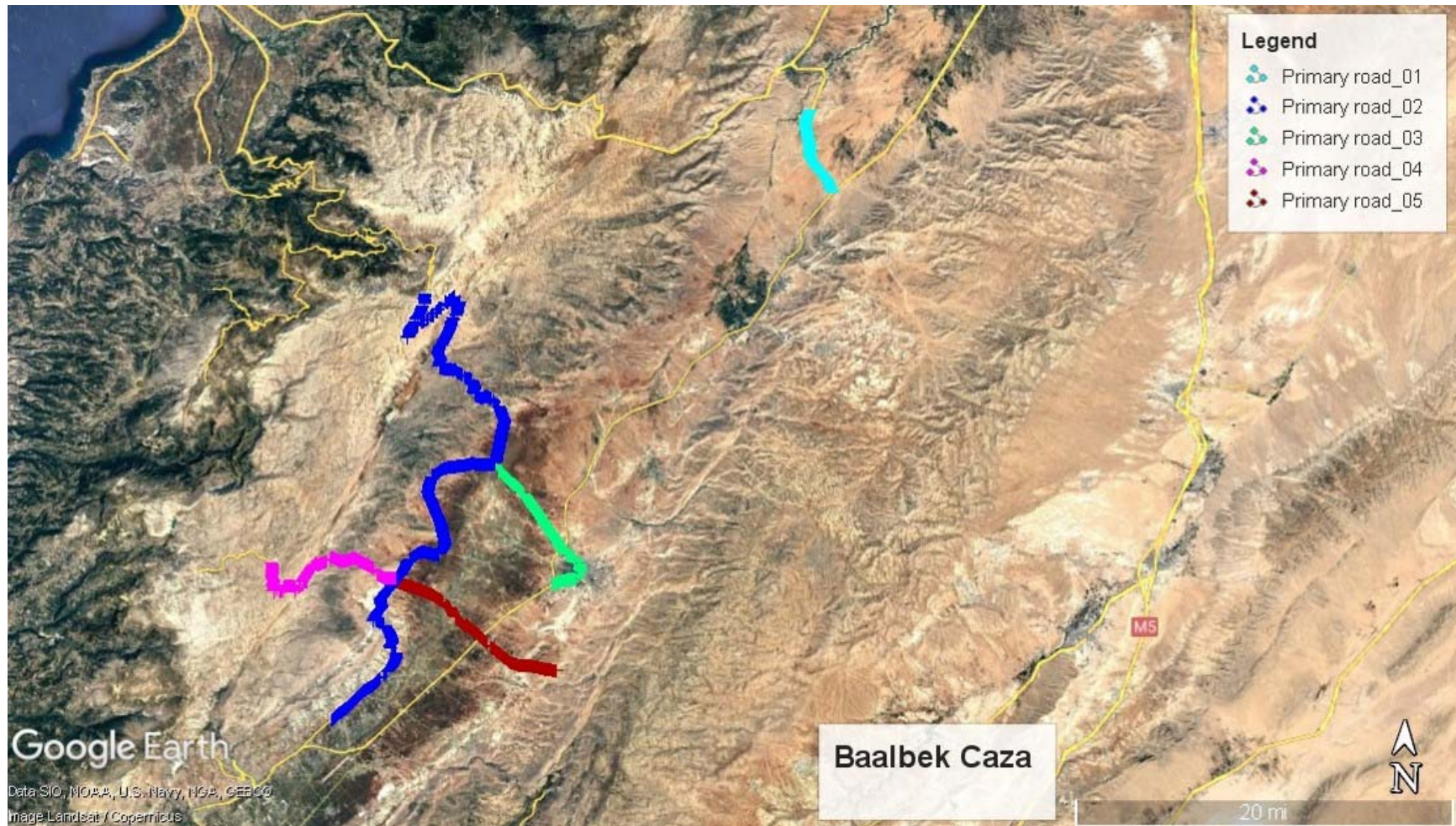


Figure 3-1. Location overview of proposed roads within the Baalbek district

3.2 Project activities

The main civil works, which are expected to take place in general under the REP including the Baalbek district, will mainly include:

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

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

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

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

In case the works imply any temporary closure of the road, the project contractor will assign alternative routes to secure traffic and reach relevant destinations. Detours and diversions were not included in the design. The original design didn't plan for detours, but the contractor will handle them as needed and after Consultant approval. Therefore, before the execution of maintenance works, the contractor based on the schedule of works and if needed, will secure the access and traffic movement via other alternative routes and means in coordination with the related Municipality. Accordingly, all detours will be on existing alternative roads (public domain properties) and there is no need to use or rent some land to create the detour. The duration of the project is 6 months.

3.3 Maintenance Activities

The proposed maintenance activities are considered light construction works that will mostly require between 20 and 30 labors, 2 Forman, 2 Engineers and 2 skilled drivers on daily basis, and minimum number of machineries to execute limited repairs in localized spots and short period. Accordingly, it was referred to as maintenance activities throughout the report to differentiate the limited work intensity from the major construction works that were executed during the rehabilitation phase.

3.3.1 Site Clearance

Site clearance will involve clearance of the land at the median area and in some cases of the land adjacent to it. Removal of vegetation cover might lead to soil erosion if not done well and in advance of further works and during the rainy season. Removing vegetation exposes soil to rainfall and wind, reducing its stability and increasing the likelihood of erosion. It should be done well in advance of further works to allow time for implementing erosion control measures and minimizing the risk of soil erosion. The dust generation from the clearing activities could potentially pose the risk to the agricultural activities in the area.

There is quite an amount of the accumulated debris and waste from the road users, especially in the drainage areas. The waste should be collected and properly disposed.

Additionally, some areas might require washing with detergents for the accumulation of the spilled oil and fuel from the traffic on the road.

3.3.2. Repair and Maintenance of Roadway Pavement

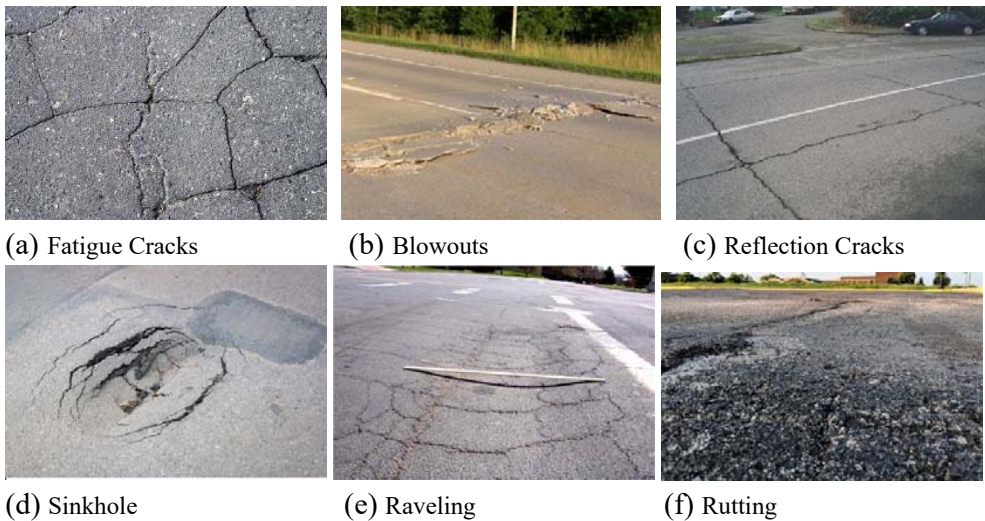
This activity involves repairing and maintaining roadway pavement by deep and shallow pothole patching. It is a common practice used to extend the life of a road and enhance the safety of drivers and pedestrians. Deep potholes require removal of damaged asphalt, repairing the underlying base, and repaving. Shallow potholes are fixed by removing the loose debris and filling the hole with new asphalt.



Figure 3-2 Asphaltting shallow potholes

3.3.3. *Repair and maintenance of localized pavement depressions*

Localized pavement depressions are repaired and maintained by milling and overlaying. Milling involves removing the damaged asphalt layer and preparing the surface for the overlay. The overlay is applied to the prepared surface to create a smooth driving surface. This process is used to fix uneven surfaces and localized pavement depressions that can cause accidents and damage to vehicles.



3.3.4. *Effective Crack Sealing for Asphalt Pavements*

Sealing cracks is an essential activity for repairing and maintaining roadways. It is a cost-effective way to extend the life of pavement and prevent further damage. Cracks, wherever found along the segments, will be cleaned and filled with a hot pour material that adheres to the pavement and seals out water and debris. This process prevents water from penetrating the pavement and causing further damage during freeze-thaw cycles.

3.3.5. Repair and Maintenance of Drainage Structures

Reinforced concrete drainage structures are repaired and maintained by removing damaged sections and replacing them with new ones. The repairs involve excavation, cleaning, and installation of new precast concrete sections. The maintenance includes regular cleaning and inspection to ensure the drainage system is functioning correctly and prevent blockages.

3.3.6. Repair and Maintenance of Curbs

Curbs are essential elements of roadways, and their maintenance and repair are necessary to ensure pedestrian and driver safety. Repairs include replacement of damaged sections and leveling of uneven curbs. Maintenance includes cleaning, painting, and inspection to ensure the curbs are in good condition and free of hazards.

3.3.7. Repair and Maintenance of Storm Water Drainage Network

Stormwater drainage networks are essential for preventing flooding and water damage to roadways. Repairs include excavation, cleaning, and replacement of damaged sections. Maintenance includes regular cleaning and inspection to ensure the drainage network is functioning correctly and prevent blockages.

3.3.8. Maintenance of Road Marking and Signage

Road marking and signage are critical elements in guiding drivers and pedestrians on the road. The management of road marking and signage involves four key activities: renewal, repair, implementation, and maintenance. These activities will be carried out based on the needs of the road. Renewal involves repainting and replacing damaged signs, while repair involves fixing damaged sections. Implementation involves the installation of new signs and markings to provide clear guidance. Maintenance activities include regular cleaning and inspection to ensure that road markings and signs remain visible and legible at all times. By managing road markings and signage effectively, we can maintain the safety and convenience of all road users.



Figure 3-3 Road Marking

3.3.9. Electrical Works

Electrical works pose a high risk of electrocution and require the qualified personnel for execution of works.

Installation will require the excavation with the adequate disposal of the excavated material. Also, the packaging materials, extra length of the cables should be properly disposed of.

3.3.10. Maintenance Equipment and Materials

The materials to be used are as following:

- Ordinary Portland cement
- Sulfate resisting cement
- Crushed aggregate 5-10mm(dry)
- Crushed sand 0-5mm (dry)
- Reinforcement bars (high yield, deformed)
- Polymer modified bitumen
- Prime coat
- Tack coat

The equipment to be used during the maintenance phase is presented in the Table below:

Table 3-2 Maintenance Equipment

Site Plant and Equipment List
Asphalt Plant
Concrete Batching Plant
Plant mix Plant for Cold Mixes
Bulldozer
Excavator
Loader
Back-Hoe Loader
Grader
Vibrating Earthwork Roller
Double Drum Asphalt Roller
Mobile Emulsion Distributor
Asphalt Paver
Asphalt Broom
Rubber Tire Asphalt Roller
Mobile Light Unit
Fuel Truck
Water Truck
Crane Truck
Dump Truck
Asphalt Dump Truck
Concrete Trans mixer Truck
Concrete Pump
Forklift
Weight Bridge
Silo Bus

Generator
Mobile Compressor
Mobile Diesel Welding Machine
Staff Vehicles
Low Bed Trailer
Lube Tanker
Tire Repair Truck
Mobile Crane
Steel Cutting Bending Set
Crushing Plant

The noise emission levels are expected to exceed the EHS Guidelines for noise levels (presented in the table below) and pose a significant health risk to the workers using the equipment.

Table 3-3 Noise Emission Levels dB (A) and Distance to the Equipment

Type	Distance between Equipment and Recipient		
	5m	20m	50m
Loader	90	78	70
Grader	90	78	70
Vibration Roller	86	74	66
Bulldozer	86	74	66
Sprayer	87	75	67
Generator	98	86	78
Impact drill	87	75	67
Impact piling	112	100	92
Concrete mixer	91	79	71
Concrete pump	85	70	62
Pneumatic hammer	84	86	78

4 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

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

All baseline related figures, tables and photos are included in Annex1.

4.1 Physical environment

4.1.1 Topography

The topography shows that the four proposed roads in the Baalbek Caza are Primary Road-01 which is located at elevations varying between 802 and 732 m. Primary Road-02 which is located at relatively high elevations varying between 993 and 1,420 m. Primary Road-03 starting at Chlifa (Arez Baalbek road) reaching Douris and falls on a relatively high altitudes ranging between 992 m and 1,117 m. In addition, Primary Road-04 is located at relatively high altitudes varying between 1,104 m and 1,282 m. Finally, Primary Road-05 is located at a relatively high altitudes ranging between 1,118 m and 1,292 m.

4.1.2 Geology

4.1.2.1 Lithology and main geological formations

The geology of the studied roads was investigated for outcropping formations, subsurface stratigraphy, structure (faults, folds, seismic, etc.), hydrogeology (groundwater and sea water intrusions) and hydrology (surface water).

The studied road is situated on the following formations provided in the geological map in Figure C, Annex B: Q (Quaternary), N-mL (Middle Miocene Neogene), E_{2b} and E_{2a} (Eocene), C₄ (Mesozoic, Cretaceous, Sannine Limestone of Cenomanian Age), C₅ (Maameltain / Ghazir Limestone, Turonian unit), C₆ (Chekka).

4.1.3 Hydrology

Geological units can be defined as aquifer or aquiclude in terms of storing and transmitting water, and these types depend on the geological environment in which they occur.

An aquifer can be a subsurface rock or sediment unit that is porous and permeable, high enough that it stores and transmits useful quantities of water. Aquifers are divided into the following categories:

- Confined: overlain by an impermeable rock unit,

- Unconfined: that is not overlain by an -impermeable rock unit, where the water in this aquifer is under atmospheric pressure and is recharged by precipitation that falls on the land surface directly above the aquifer,
- or Semi-confined: partially confined, or overlain, by gravel, sand, silt or soil layers of low permeability through which recharge and discharge can still occur.

Aquiclude is a geological formation which, although porous and capable of absorbing water, does not permit its movement at rates sufficient to furnish an appreciable supply for a well or spring. Alternatively, it could be an impermeable body of rock or stratum of sediment that acts as a barrier to the flow of groundwater.

The study area for Baalbek Caza roads is characterized by the presence of aquifer, aquiclude and open semi-aquifers within the various formations:

- Aquifers in the area are Maameltain / Ghazir Limestone, Turonian unit (C5), and Eocene E2b. The limestone formation forms a main part to the study area and is the most important karstic system in the study area characterized by a significant amount of groundwater flowing in channels, faults and fractures. These fractures include solution joints, solution pits, lapiaz, grooves and sinkholes. Cavities in the rocks are often filled with calcite and cave deposits.
- Aquiclude along the area is the (C6) Chekka formation. These deposits constitute an aquiclude due to the presence of marls and marlstones with low hydraulic conductivity. However, low to medium discharge springs are present in this formation.
- Semi-Aquifers in the area are the N- mL Middle Miocene Neogene and Quaternary (Q) formations, which are composed of sand, with very high permeability, and clay, with low permeability are present within these deposits. In relation to permeability and porosity, there are no important fractures or joints within these formations that is why they are classified as a semi-aquifer.

4.1.4 Climate and meteorology

The climate and meteorological parameters play an important role in the transport and dispersion of pollutants in the atmosphere. Wind speeds and wind directions are responsible for carrying pollutants from the proposed roads to nearby communities both during the maintenance and operation phases. On the other hand, precipitation controls the rates of runoff. Meteorological data for the study region are best represented through long term monitoring stations in that region. Meteorological data are obtained either from the closest available stations and whenever not available satellite data are used and referenced in the text.

Precipitation Rates

Precipitation in the summer season between the month of June and September is negligible (~ 12.5 mm) along the road (Figure H in Annex 1). The highest precipitation is recorded in February with an average value of 137 mm and the total annual precipitation is 631 mm.

Temperature (Land Surface)

The hottest month in the area is August (30.4 °C) and the coldest month is January (1° C). Fluctuations in the temperature values are shown in Figure I (in Annex 1).

Wind Records

This report will use freely publicly available modelled or prognostic data provided by Meteoblue. Meteoblue is a prognostic climate model that has more than 220 million data points and a resolution of 30 arc seconds, with a spatial resolution of maximum 30 km, and has been collecting climate data from the year 1982 until 2012 (30-year period). In this context, dominant wind in the area is wind that blows from the West towards the East with speeds varying between 0.3 m/s and 8m/s. Refer to Figure J for distribution of wind speed, direction, and frequency.

4.1.5 Ambient air quality and noise levels

a) Air Quality

Air quality is an essential component in assessing social wellbeing and health status of a community. Developing baseline information will help in comparing the impacts of the project relative to the existing conditions. Ambient air quality data was gathered from the UNDP project “Air quality assessment in an East Mediterranean country: the case of Lebanon” which is based at the Ministry of Environment. The UNDP/MoE monitors the criteria pollutants: Particulate Matter (PM), Ozone (O3), Carbon monoxide (CO), Nitrogen dioxide (NO2), Sulfur dioxide (SO2) which are recognized by national and international organizations as good indicators of anthropogenic emissions.

Traffic emissions represent the main source of air pollution in the project area with generators constituting another source in residential areas at times of electricity disconnection. Air quality monitoring in Lebanon in general is weak and adhoc with no systematic continuous monitoring.

It is based mostly on individual efforts at academic institutions with a recent effort through the MoE that acquired several stations spread throughout Lebanon, particularly in urban areas. Unfortunately, the stations have stopped because of lack of resources and the existing data is not reliable because of lack of equipment calibration, to the best of our knowledge.

Data for Cell 2, cell 7, cell 1 and cell 10 are considered to be the most representative, being the closest to this study area in terms of distance as well as prevalent socio-economic activities, i.e. mostly rural and light residential. Table 4-1 shows that the annual concentrations for all criteria air pollutants for these cells and for the other cells which are located close to the urban/rural region, are below the national ambient air quality standards defined by MOE Decision 16/1.

The air quality cells representing the studied roads are presented in Figure P.

Table 4-1 Ambient air quality in $\mu\text{g}/\text{m}^3$ for studied roads

Cell ID	NO ₂	O ₃	PM ₁₀	PM _{2.5}	SO ₂	CO
1	11.45	77.74	13.89	12.31	7.23	240.79
2	17.33	74.05	14.69	13.04	9.95	312.72
7	7.34	85.43	12.74	11.19	5.44	209.67
10	33.02	61.53	18.62	16.76	15.85	588.35
Lebanese Ambient Air Quality standards, Decision 52/1	100	100	80	-	80	10,000
NAAQS, EPA	107.6	147.7	150	35	84.6	11,070
Exposure Duration	1 year	8 hours	24 hours	24 hours	1 year	8 hours

The average concentration of the chosen criteria pollutants presented in Table 4-3 above show good ambient air quality along the roads as the numbers are much less than permissible limits presented in the national guidelines (Decision 16/1) and the international USEPA National Ambient Air Quality Standards (NAAQS) standards.

b) Noise

Similarly, vehicles and some generators in residential areas constitute the main source of noise. While no noise measurements are available along the proposed roads, various studies have been conducted on noise measurements in specific projects / studies although no systematic noise monitoring in the country exists. In the context of the proposed roads it is expected that the baseline average continuous A-weighted noise levels during the day time will vary between 45 to 80 dBA depending on time of day, traffic conditions and proximity to the roads. Measurements were taken based on the working stations assigned by TEAM INTERNATIONAL. The schedule of the acoustic survey was planned based on availability of transportation, availability of the handheld decibel meter, availability of staff, and availability of time. Note that these levels exceed the national standards of 30-40 dBA for rural areas. However, as mentioned earlier, the national standards are very stringent and hard to meet along

roads. Hence, it is more realistic to consider the FHWA (1997) noise criterion of 67 dBA for residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreational areas, playgrounds, parks.

4.2 Biological Environment

In the context of this ESMP for the road maintenance project in Baalbek Caza, the direct influence area concerns existing roads. Consequently, a rapid biological assessment has been carried out to draw the ecological profile of the adjacent areas to the concerned road, assess key habitats and flora diversity to identify those species endangered or IUCN-listed that are at added risk from the proposed project. This will serve the management plan and the mitigation measures that will be taken in order to reduce the project's potential impact on the local environment.

The assessment was based on field surveys and generated Land use/Land Cover (LULC) maps for each studied road.

4.2.1 General Field Survey

Dates, Methodology, and Limitations

Given the limited timeframe of this study, a single field visit was set for each road (not necessarily during the best period for field visits due to time limitations). The field investigation did not aim for an exhaustive inventory of the biodiversity of the project area but a general overview of present species (mainly flora) and habitats. This general approach allows the identification of the conservation status of the natural habitats.

Moreover, LULC maps were generated for each road and compiled with site visits observations with respect to adjacent key habitats to the concerned roads.

Walking transects were recognized to obtain an understanding of the vegetation communities in the area and record existing species. Knowing that a single visit is not enough, the study had to consider some species as potentially present. Moreover, it was difficult to perform a complete faunal survey. Thus, information on fauna does not only include the encountered species during the field visit, but also potential species were considered in this assessment (fauna listing is only provided for roads that involve rich habitats). The potentiality of presence of a species was based on: (a) the occurrence of the species habitat; (b) observations of the species near the study area; (c) the fact that the study area is in the distribution range of the species; and (d) related scientific papers.

4.2.2 General Evaluation Criteria

Various regulatory and scientific criteria allow organizing in a hierarchy the importance of habitats and species observed in a given area. These criteria include the endemism, rarity, the

ecological importance (key species, specialized species, etc.); the biological status (migratory species, breeding species, etc.); and the biological susceptibility.

There is no list of protected species in Lebanon. The protected species are therefore considered based on international conventions for which Lebanon is part of and the IUCN Middle East red list. In this assessment, the ecological value of species was based on their local ecological importance (distribution of species and degree of endemism (Tohmé and Tohmé, 2014) and IUCN classification).

4.2.3 Results per Road

Study Area

Primary Road -01(Ras Baalbek to Ras Al Assi)

Project settlement

The road is settled at an altitude ranging between 802 and 732 meters. According to CORINE classification, ‘Thermo-Mediterranean’ zone ranges from 0 to 500 meters, ‘EU-Mediterranean’ zone ranges from 500 to 1000 meters, whereas, Supra-Mediterranean zone ranges from 1,000 to 1,500. The altitudinal range plays an important role in plant composition (Abi Saleh, 1996). Thus, the studied area covers ‘Thermo-Mediterranean zones.

Natural Habitats and Associated Flora

The main encountered habitats that are adjacent to primary road-01 are primarily artificial (built-up) areas, agricultural areas and grasslands as per field visit and the LULC map (see figure E, Annex 1).

The studied road involves a path that is already under anthropogenic influences. The road is mainly bordered by human settlements and agricultural lands.

Given that the studied road does not involve rich ecosystems, no listing of flora or fauna will be provided for this road.

Table 4-2: Main habitats encountered along primary road-01

Habitats types in LULC Map	Field visit observation
Agricultural areas	Agricultural terraces Fallow lands Cultivated trees
Grasslands	Degraded grasslands Scrublands and grasslands used for grazing, agriculture and forage
Artificial areas	Residential and industrial areas

Primary Road -02 (Tamnine El Faouqa-Ainata)

Project settlement

The road is settled at an altitude ranging between 993 and 1420 meters. According to CORINE classification, ‘Thermo-Mediterranean’ zone ranges from 0 to 500 meters, ‘EU-Mediterranean’ zone ranges from 500 to 1000 meters, whereas, Supra-Mediterranean zone ranges from 1,000 to 1,500. The altitudinal range plays an important role in plant composition (Abi Saleh, 1996). Thus, the studied area covers ‘Thermo-Mediterranean’, ‘EU-Mediterranean’ and ‘Supra-Mediterranean’ zones.

Natural Habitats and Associated Flora

The main encountered habitats that are adjacent to primary road-02 are primarily artificial areas, agricultural areas and grasslands as per field visit and the LULC map (see figure E, Annex 1).

The studied road involves a path that is already under anthropogenic influences. The road is mainly bordered by human settlements and agricultural lands.

Given that the studied road does not involve rich ecosystems, no listing of flora or fauna will be provided for this road.

Table 4-3: Main habitats encountered along primary road-02

Habitats types in LULC Map	Field visit observation
Agricultural areas	Agricultural terraces Fallow lands Cultivated trees
Grasslands	Degraded grasslands Scrublands and grasslands used for grazing, agriculture and forage
Artificial areas	Residential and industrial areas

The cultivated trees and degraded grasslands bordering primary road-02 are presented in Figure Q.

Primary Road -03 (Chlifa-Douris)

Project settlement

The road is settled at an altitude ranging between 992 and 1117 meters. Thus, the studied area covers the ‘Eu-Mediterranean’ and ‘Supra-Mediterranean’ zones. The altitudinal range plays an important role in plant composition (Abi Saleh, 1996).

Natural Habitats and Associated Flora

The main encountered habitats that are adjacent to primary road-03 are primarily artificial areas, and agricultural areas.

The studied road involves a path that is already under anthropogenic influences. The road is mainly bordered by human settlements and agricultural lands.

Given that the studied road does not involve rich ecosystems, no listing of flora or fauna will be provided for this road.

Table 4-4 Main Habitats encountered along primary road-03

Habitats types in LULC Map	Field visit observation
Agricultural areas	Agricultural terraces Fallow lands Cultivated trees Greenhouses,
Artificial areas	Residential and industrial areas

Primary Road -04 (Hadeth Baalbek-Slouqi)

Project settlement

The road is settled at an altitude ranging between 1104 and 1282 meters. Thus, the studied area covers the 'Eu-Mediterranean' and 'Supra-Mediterranean' zones. The altitudinal range plays an important role in plant composition (Abi Saleh, 1996).

Natural Habitats and Associated Flora

The main encountered habitats that are adjacent to primary road-04 are primarily artificial areas, agricultural areas.

The studied road involves a path that is already under anthropogenic influences. The road is mainly bordered by human settlements and agricultural lands.

Given that the studied road does not involve rich ecosystems, no listing of flora or fauna will be provided for this road.

Table 4-5 Main Habitats encountered along primary road-04

Habitats types in LULC Map	Field visit observation
Agricultural areas	Fallow lands Cultivated trees Greenhouses,
Artificial areas	Residential and industrial areas

Primary Road -05 (Nabi Rached -Brital)

Project settlement

The road is settled at an altitude ranging between 1118 and 1292 meters. Thus, the studied area covers the 'Supra-Mediterranean' zone. The altitudinal range plays an important role in plant composition (Abi Saleh, 1996).

Natural Habitats and Associated Flora

The main encountered habitats that are adjacent to primary road-05 are primarily artificial areas, agricultural areas.

The studied road involves a path that is already under anthropogenic influences. The road is mainly bordered by human settlements and agricultural lands.

Given that the studied road does not involve rich ecosystems, no listing of flora or fauna will be provided for this road.

Table 4-6 Main Habitats encountered along primary road-05

Habitats types in LULC Map	Field visit observation
Agricultural areas	Agricultural terraces Fallow lands Cultivated trees Riparian habitats
Artificial areas	Residential and industrial areas

The residential units near the road side are presented in Figure R.

4.3 Socioeconomic Environment

4.3.1 Demographic Profile

The proposed five roads in Baalbek pass serve several villages in the Caza. Baalbek governorate has a total population of 416,427. Most of the population live in the Baalbek city as it is the administrative and economic capital of the region. The city holds the largest human concentration in the area, with 93,000 inhabitants and a population density of 234 persons/hectare. Of the total resident population in Baalbek region, 5,117 are displaced Palestinian (UNHCR, 2015).

The resident population of Baalbek is composed of 50.5% males and 49.5% female, almost identical to the wider Baalbek/Hermel region. The age-sex pyramid indicates a more even pattern of growth in the female side of the pyramid rather than that of males in the same age group. This pyramid also indicates an overall decline in the “youth” population. Those in the 0-4 year’s old age group form 8% of the total population, while 5-9 age group and 15-19 age cohort form, respectively, 11.6% and 13.7% of the total population. There is also a substantial decrease in the younger adult age groups (22-44) which constitute the bulk of the labor force (UNHCR, 2015). Syrian Refugees

106, 883 are registered Syrian refugees (UNHCR, 2023). Out of the total registered displaced Syrians, 54.5% are living in substandard shelter, including the 37.4% residing in informal settlements in Bekaa and Baalbek-Hermel governorates. For instance, the 532 informal settlements are hosting 53,585 registered Syrians displaced. Also, 2.5% of the displaced people live in collective shelters (UNHCR, 2015). The remainder live in rented apartments within the existing communities.

It is to be noted that the project activities will have negligible significant impacts on the Syrian refugees’ camps, as the works are localized, limited in scale, short in time and will not entail any possible full road closure. Most of the refugee camps are located between 50 m and 100 m away from the concerned road, thus necessary measures for their safety and

particularly children should be put in place, maintained and monitored throughout project works.

Refugees' camps are located near the concerned roads:

- In Ain Saaide, the closest refugee camp is 50 m away from the road (Refer to Figure L in Annex 1).
- In Deir El Ahmar, the closest refugee camp is situated at a 90 m distance (Refer to Figure M in Annex 1).
- On the way to Deir El Ahmar center, there are scattered refugee camps and the closest cluster is at a 160 m distance (Refer to Figure N in Annex 1).
- On the road leading to Iaat, the closest camp is located at a 100 m distance (Refer to Figure O in Annex 1).
- On the road leading to Taraya, no camps are seen at close vicinity of 100 m.

Table 4-7 Number of Syrians Displaced in Baalbek District

Caza	Total No. of Persons
Baalbek	106,883

Source: UNHCR, 2023 (refer to Figure K in Annex 1)

According to the map of Syrian Refugees Distribution in Baalbek Caza (refer to Figure G, Annex 1), the number of Syrians in close proximity to the activities under this project is about 10,000 persons (Source: CDR, DAG, & Dubertret).

Infrastructure

Baalbek suffers from poor physical infrastructure. Most of the region's infrastructure is in deprived conditions (CDR, 2001).

- Electricity cables are usually seen to be hanging across the streets. In addition, some financially strained residents have illegally diverted power supplies from electricity poles in the streets to their households.
- Lack of pipe connections between potable water distribution facilities and many households. Inhabitants highly depend on polluted wells to maintain their water needs. Very frequent shortage of water supply is seen within the region, as in some areas, fresh water supplies average only 15 minutes per week. Most businesses resort to buying water from private distributors every two or three days, and pay around 2,500,000.00 Lebanese pounds (LBP) per cubic meter of water.
- Baalbek suffers from acute traffic congestion, especially at peak hours. The poorly asphalted and barely maintained roads aggravate the problem.
- Lack of garbage bins in the streets, increasing the haphazard disposal of solid waste in the area.

4.3.2 Economic Activities

The primary economic sector of the region is agriculture which draws only 21% of the active population. Industrial production, including local industries, construction, artisanal products and commerce attracts 25% of the active population, while 54% are employed in services including public (administration, health, education, and army) and private sectors (private

medical services, banks, and tourism or leisure activities). Moreover, the percentage of military personnel is significantly high, attaining 14% (CDR, 2001).

Currently, majority of Baalbek's population is employed in the agricultural sector, scattered in population clusters with strong tribal traditions. However, agro-industrial outlets are scarce and number of existing small-scale handicraft industries are decreasing due to the lack of market opportunities and competition from imported goods from neighboring countries and the Far East. The region also lacks major visitor-related shopping or activities other than the headwear of Bedouin Arabs, local handicrafts, small-scale manual labor based industrial enterprises (such as blacksmiths, carpet weavers). High unemployment rate continues to prevail, with around 30% of the active population unemployed, superseding the national figure of 24%. The two largest agro-industrial enterprises in the region, a dairy and meat enterprise and a plastic factory hiring less than 50 employees (CDR, 2001). These are not impacted by the project activities

4.3.3 Educational Services

Baalbek suffers from low school enrollment rates, as well as from high levels of illiteracy with about 13.6% of those over 10 years old classified as totally illiterate. The number of illiterates increases with age, likewise in significantly higher numbers among the females. The educational level of the overall population varies significantly across age groups and amongst the sexes. The percentage of individuals with elementary level education only is considerably high especially among females. While the percentage of university graduates in the 20-24 and 25-44 age groups seems the same across genders, yet the percentage of male university graduates is higher. This can be attributed to the large number of professionals and civil servants in the area (CDR, 2001).

Further, the region includes 130 public schools (CDR, 2001). There are several schools and universities in Baalbek such as Al Mortada high school- Modern international school- متوسطة بوادي الرسمية. that are located in a close proximity to the roads to be maintained. Those schools will not be affected as the project activities will not take place during the school hours, taking into consideration the impact of the noise on the students.

4.3.4 Traffic Assessment

The Primary Road-01 stretches from Ras Baalbak towards Ras Al Assi, and has a 7,69 km length. The Primary Road-02 stretches from Tamnine El Faouqa towards Ainata, and has a 64,3 km length. The Primary Road-03 stretches from Chlifa towards Douris, and has a 15,1 km length. The Primary Road-04 stretches from Hadethh Baalbek towards Slouqi, and has a 17,4 km length. The Primary Road-05 stretches from Nabi Rached towards Brital, and has a 16,6 km length.

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

Traffic assessment was done by the designer using previous collected data (traffic count was carried out by the same designer (TEAM Int.) in 2018 during the rehabilitation phase) due to time constraints. Accordingly, traffic volume is moderate to low and vehicle vary between passenger cars, transportation trucks, busses and vans.

4.3.5 Road Sensitive receptors

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

The sensitive receptors directly affected by the proposed primary roads based on the field survey are agricultural lands, residential areas, commercial areas, schools and houses of worship. Furthermore, the primary roads house an active commercial and residential center.

Along the primary road-02, there are houses of worship (including Mar Mikhael church), schools (Al Mortada high school-المتوسطة بوادي الرسمية).

Moreover, along the primary road-03, several houses of worship (Al imam Al mountazar-Saqqyida Khawla Shirine-etc.) and one school (Modern international school) were observed along the road. As well, there are a school called Heliopolis High school is way with a distance of about 250m from the maintained road.

Prophit Zakaria Shrine (مقام ديني) is located at about 125m from Road no. 05 at Brital area and Mousa El Kadem Mosque is located at about 100m from the same road. As for, Imam Ali Mosque it is very close to the road being distant for about 20m only. Moreover, Al Hijja School is also found at the road close premises with about 15m.

Extra precautions need to be taken near the Deir El Ahmar police station and General Security Governmental Office in order to prevent the closure of their entrances.

Additionally, measures need to be taken to prevent any inconvenience to the groundwater due to the presence of snow in Nessef el Batrak -Bsharri along the Ainata.

There are no major sites of cultural heritage significance that are located directly along the proposed roads. In summary, the main sensitive receptors of concern include, agricultural and the nearby residence and healthcare centers. Depending on the maintenance needs, if work is done next to sensitive sites of cultural heritage significance, the Directorate General of Antiquities will be contacted for consent.

The Baalbek Temple found at about 50m distance from road-03, is presented in Figure S and the Baalbek thermal power station along road-03 is presented in Figure T.

Table 4-8 Sensitive receptors near concerned roads

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
Primary road -02	Al Mustapha School	Qsarnaba	33°54'08.43"N 36°00'07.49"E	At a 2.4 km distance from the start of the	<ul style="list-style-type: none"> Noisy and/or dust emission activities

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
				road (Tamnine El Faouqa)	will not be conducted during teaching hours and will be pushed for after school hours (if required)
	Nabil Adib Suleiman Official High School	Bednayel	33°54'33.23"N 36°00'39.36"E	At a 3.51 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> Water spraying should be frequent activity to avoid dust emission in dry season.
	Nahda Teaching Center	Kfar Dabach	33°56'47.06"N 36°02'04.27"E	At a 6.5 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> All works are to be conducted within the work zone with no entry restriction instruction.
	Al Jawad International School	Kfar Dabach	33°57'12.80"N 36°02'00.09"E	At a 7.4 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> Flagger man should be provided if partial road closure is required to avoid traffic congestion during departure hours.
	Mosque	Taraya, Nabi Rachad	33°59'41.91"N 36°02'15.99"E	At a 15.2 km distance from the start of the road (Tamnine El Faouqa)	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above mentioned mitigations)
	Shabab Al Mustakbal School	Kfar Dan	34°00'32.21"N 36°02'46.16"E	At a 17 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> Noisy and/or dust emission activities will not be conducted during teaching hours and will be pushed for after school hours (if required)
	Al Nabi Youssef ben Yaacoub shrine	Kfar Dan		At a 20.8 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> Water spraying should be frequent activity to avoid dust emission in dry season.
	Al Mortada High-school	Bodai	34°03'18.33"N 36°04'05.02"E	At a 24.7 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> All works are to be conducted within the work zone with

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
	Bodai Official Middle School	Saaideh	34°03'31.64"N 36°03'51.47"E	At a 25.2 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> no entry restriction instruction. • Flagger man should be provided if partial road closure is required to avoid traffic congestion during departure hours.
	Chlifa Official Middle School	Chlifa	34°05'07.46"N 36°05'51.89"E	At a 30 km distance from the start of the road (Tamnine El Faouqa)	
	Sisters of the Cross general hospital	Chlifa	34°05'07.82"N 36°06'00.65"E	At a 30.5 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> • Timing and Noise Control: Schedule noisy and dusty activities outside of peak hours to minimize disruption. Use dust suppression methods like frequent water spraying. • Traffic Management: Implement clear signage and detours, and deploy flaggers to manage traffic and prevent congestion, ensuring emergency vehicle access. • Access and Safety: Maintain uninterrupted access to the health centre or hospital for patients, visitors, and emergency vehicles. • Communication: Provide advance notice and regular updates to the health centre or hospital about the road maintenance schedule and progress.

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					<ul style="list-style-type: none"> Odor Control: Implement measures to control any unpleasant odors from maintenance materials or machinery, which could affect sensitive individuals such as usage of low-odor materials, ensuring proper ventilation, covering materials, applying odor-neutralizers, maintaining cleanliness, and constructing temporary barriers.
	Virgin Lady Church	Chlifa	34°05'11.00"N 36°06'24.47"E	At a 31.1 km distance from the start of the road (Tamnine El Faouqa)	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Notre Dame De La Tour School	Deir El Ahmar, Betdaai	34°05'07.82"N 36°06'00.65"E	At a 35 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> Noisy and/or dust emission activities will not be conducted during teaching hours and will be pushed for after school hours (if required) Water spraying should be frequent activity to avoid dust emission in dry season. All works are to be conducted within the work zone with no entry restriction instruction.
	Soeurs maronites de la sainte famille School	Deir El Ahmar, Betdaai	34°06'30.49"N 36°07'55.48"E	At a 36.8 km distance from the start of the road (Tamnine El Faouqa)	

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					<ul style="list-style-type: none"> • Flagger man should be provided if partial road closure is required to avoid traffic congestion during departure hours.
	Police Station	Deir El Ahmar	34°07'09.73"N 36°07'52.29"E	At a 39 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> • Provide real-time updates about the maintenance schedule and activities • Schedule work to avoid peak hours, especially during critical operations • Use low-noise construction equipment to minimize disturbances. • Ensure unobstructed access for emergency vehicles with clear signage for detours. • Implement air filtration systems on equipment to reduce dust emissions. • Conduct regular check-ins with security personnel to address any concerns during maintenance. • Maintain clear access routes to ensure uninterrupted operations.
	General Security Government Office	Deir El Ahmar	34°07'13.39"N 36°07'50.62"E	At a 39.2 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> • Provide real-time updates about the maintenance schedule and activities • Schedule work to avoid peak hours,

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					<p>especially during critical operations</p> <ul style="list-style-type: none"> • Use low-noise construction equipment to minimize disturbances. • Ensure unobstructed access for emergency vehicles with clear signage for detours. • Implement air filtration systems on equipment to reduce dust emissions. • Conduct regular check-ins with security personnel to address any concerns during maintenance. • Maintain clear access routes to ensure uninterrupted operations.
	Saint Joseph Church	Deir El Ahmar	34°07'31.10"N 36°07'44.00"E	At a 40 km distance from the start of the road (Tamnine El Faouqa)	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Mar Mkhayel Church	Bsayleh El Tahta	34°07'55.69"N 36°07'18.16"E	At a 41.1 km distance from the start of the road (Tamnine El Faouqa)	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Deir El Ahmar Medical Center	Bsayleh El Tahta	34°07'58.56"N 36°07'17.28"E	At a 41.2 km distance from the start of the road (Tamnine El Faouqa)	<ul style="list-style-type: none"> • Timing and Noise Control: Schedule noisy and dusty activities outside of peak hours to minimize

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					<p>disruption. Use dust suppression methods like frequent water spraying.</p> <ul style="list-style-type: none"> • Traffic Management: Implement clear signage and detours, and deploy flaggers to manage traffic and prevent congestion, ensuring emergency vehicle access. • Access and Safety: Maintain uninterrupted access to the health centre or hospital for patients, visitors, and emergency vehicles. • Communication: Provide advance notice and regular updates to the health centre or hospital about the road maintenance schedule and progress. • Odor Control: Implement measures to control any unpleasant odors from maintenance materials or machinery, which could affect sensitive individuals such as usage of low-odor materials, ensuring proper ventilation, covering materials, applying odor-neutralizers,

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					maintaining cleanliness, and constructing temporary barriers.
	Nessef el Batrak - Bsharri Groundwater	Aainata	34°12'28.56"N 36°03'29.35"E	At a 500 m distance before the end of the road of Ainata (Arez-Baalbek Road)	<ul style="list-style-type: none"> • Provide real-time updates about the maintenance schedule and activities • Schedule work to avoid peak hours, especially during critical operations • Use low-noise construction equipment to minimize disturbances. • Ensure unobstructed access for emergency vehicles with clear signage for detours. • Implement air filtration systems on equipment to reduce dust emissions. • Conduct regular check-ins with security personnel to address any concerns during maintenance. • Maintain clear access routes to ensure uninterrupted operations.
Primary road -03	Hospital	Iaat	34°02'01.57"N 36°10'43.92"E	At a 7.5 km distance from the start of the road of Chlifa (Arez-Baalbek Road)	<ul style="list-style-type: none"> • Timing and Noise Control: Schedule noisy and dusty activities outside of peak hours to minimize disruption. Use dust suppression methods like frequent water spraying.

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					<ul style="list-style-type: none"> • Traffic Management: Implement clear signage and detours, and deploy flaggers to manage traffic and prevent congestion, ensuring emergency vehicle access. • Access and Safety: Maintain uninterrupted access to the health centre or hospital for patients, visitors, and emergency vehicles. • Communication: Provide advance notice and regular updates to the health centre or hospital about the road maintenance schedule and progress. • Odor Control: Implement measures to control any unpleasant odors from maintenance materials or machinery, which could affect sensitive individuals such as usage of low-odor materials, ensuring proper ventilation, covering materials, applying odor-neutralizers, maintaining cleanliness, and constructing temporary barriers.

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
	Modern International School- MIS	Iaat	34°01'40.99"N 36°11'03.04"E	12.7 m away from the concerned road in Iaat.	<ul style="list-style-type: none"> Noisy and/or dust emission activities will not be conducted during teaching hours and will be pushed for after school hours (if required) Water spraying should be frequent activity to avoid dust emission in dry season. All works are to be conducted within the work zone with no entry restriction instruction. Flagger man should be provided if partial road closure is required to avoid traffic congestion during departure hours.
	Umayyad Mosque of Baalbek	Baalbek	34°00'25.01"N 36°12'25.54"E	14.5 m away from the concerned road in Baalbek	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Al Waleed Amawi Mosque	Baalbek	34°00'25.01"N 36°12'25.55"E	33 m away from the concerned road in Baalbek	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Historical Landmark of Baalbek Roman Ruins	Baalbek	34°00'24.56"N 36°12'21.83"E	80 m away from the concerned road in Baalbek	<ul style="list-style-type: none"> Provide real-time updates about the maintenance schedule and activities Schedule work to avoid peak hours,

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					<p>especially during critical operations</p> <ul style="list-style-type: none"> • Use low-noise construction equipment to minimize disturbances. • Ensure unobstructed access for emergency vehicles with clear signage for detours. • Implement air filtration systems on equipment to reduce dust emissions. • Conduct regular check-ins with security personnel to address any concerns during maintenance. • Maintain clear access routes to ensure uninterrupted operations.
	Sayyida Khawla Shrine	Baalbek	34°00'05.90"N 36°12'07.36"E	42.4 m away from the concerned road in Baalbek	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	The grand Shiite mosque of Baalbek	Baalbek	34°00'05.47"N 36°12'07.78"E	11 m away from the concerned road in Baalbek	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	School	Baalbek-Hermel	33°59'52.12"N 36°10'56.53"E	100 m away from the concerned road near Douris.	<ul style="list-style-type: none"> • Noisy and/or dust emission activities will not be conducted during teaching hours and will be pushed for

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
					after school hours (if required) <ul style="list-style-type: none"> • Water spraying should be frequent activity to avoid dust emission in dry season. • All works are to be conducted within the work zone with no entry restriction instruction. • Flagger man should be provided if partial road closure is required to avoid traffic congestion during departure hours.
Primary road -04	Nabi Zakaria shrine	Taraya	33°56'06.11"N 36°10'24.58"E	134 m away from the concerned road near Taraya.	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Imam Kazem Mosque	Britel	33°56'00.65"N 36°09'39.67"E	82 m away from the concerned road near Britel	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Imam Ali Mosque	Britel	33°56'01.82"N 36°09'11.13"E	-15 m away from the concerned road near Britel	Praying times will be taken into consideration in order to not let the project activities have an impact. (in addition to the above-mentioned mitigations)
	Imam Mahdi Mosque	Britel	33°56'36.95"N 36°07'57.64"E	-17 m away from the concerned	Praying times will be taken into consideration in order to not let the project

Road	Sensitive receptor	Location	Coordinates	Distance	Mitigation Measures
				road near Britel	activities have an impact. (in addition to the above-mentioned mitigations)

4.3.6 *Land use/land cover patterns*

The land use and land cover in an area refers to both natural landscape and anthropogenic activities occupying the regions. The proposed roads in the Baalbek Caza pass largely through rural areas. Figure E (Annex 1) shows the main land use land covers of the Baalbek Caza as well as those in the immediate vicinity of the proposed roads. The roads generally cross through artificial areas, agricultural areas and grasslands.

5 POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS

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

The assessment methodology is attached in Annex A.

5.1 Potential Environmental and social impacts during the maintenance phase

Table 5-1. Environmental and Social Negative Impacts for the Baalbek district roads during the maintenance phase

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
Environmental Impact				
Deterioration of Air quality	Surrounding Communities, Fauna and Flora, and	<ul style="list-style-type: none"> Usage of maintenance equipment Shallow excavation Levelling works Transport vehicles delivering maintenance materials, Disturbances of stockpiles by winds and material handling 	Negative impact from Air Emission of equipment and dust from stockpiles	Minor to moderate negative impact
Increase in Noise levels	Surrounding Communities and Fauna.	<ul style="list-style-type: none"> Use of heavy machinery Excavation and milling works Labours shouting Evacuation of materials Vibrations of heavy equipment Increased vehicle speeds and noise levels due to new good road condition 	Negative impact creating stress on nearby homes and Baalbek temple.	Moderate negative impact
Loss of Biodiversity	Surrounding Fauna and Flora	<ul style="list-style-type: none"> Dust from maintenance works Wastewater from maintenance and domestic disposal Destruction of surrounding trees and plantations Disturbance of surrounding inhabitants with load sounds 	Negative impact that could cause loss of surrounding inhabitant	Minor negative impact
Generation of Maintenance and excavation waste	Biodiversity, surface and ground water and soil	Soil waste, milling materials, domestic wastes improperly disposed	Negative impact from contamination water resources and soil. Also, possible blocking of streams.	Major negative impact
Deterioration of Water and soil quality	Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> Runoff and erosion from site surfaces, drainage channels, earth working areas and stockpiles; Wash water from dust control; Fuel, oil, solvents and lubricants leakage from machinery and equipment 	Negative impact from contamination water resources and soil.	Moderate negative impact

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
		<ul style="list-style-type: none"> Domestic wastewater from project offices 		
Resources consumption	Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> Increase quarrying causing raw materials depletion Increase quarrying causing dust, noise, and vibrations Increase transportation of heavy vehicles Increase water pumping 	Negative impact from fill and maintenance material, and water depletion	Moderate to low negative impact
Landscape and visual intrusion	Surrounding Communities	<ul style="list-style-type: none"> Soil erosion Excavation activities 	Negative impact from depletion of the vegetative cover on the side roads and visual impact on the landscape	Minor to low negative impact
Social Impact				
Traffic	Surrounding Communities and road users, and workers	<ul style="list-style-type: none"> Reducing traffic flow Possible temporary block of accessibility 	Negative Impact due to possible traffic congestions or accidents occurrence.	Moderate during short time negative impact
Existing infrastructure	Surrounding Communities	<ul style="list-style-type: none"> Cut-off water supply pipes Destruction of electricity cables or/and phone lines. Block of drainage channels and/or wastewater collection network 	Negative Impact due to possible loss of services	Moderate during short time negative impact
Social tensions	Surrounding Communities and workers	The feeling of discrimination or harassment due to hiring of foreign labours	Negative impact due to conflict over jobs or dissatisfaction	Minor to low negative impact
Child labour	Refugee and poor communities	Allowing child to work in unsafe construction environment and preventing him the right of proper education	Negative Impact due to abuse and exploitation	High during long time negative impact
Labour conditions	Refugee and poor communities	<ul style="list-style-type: none"> low wages, absence of social security and employment benefits unequal job opportunities 	Negative Impact due to possible abuse of rights	High during long time negative impact
SEA/SH associated with potential Labour Influx	Women and children	Labour influx in close proximity to local communities may increase the risk of SEA/SH incidents	Negative Impact due to possible hassle creation with surrounding communities and road users	High during short time negative impact
Health and safety impacts	Surrounding Communities and road users (The Public)	<ul style="list-style-type: none"> Improper traffic management Land obstacles and uncovered holes The good road condition will have the speed 	Negative Impact due to accident occurrence	High during long time negative impact
	Workers	<ul style="list-style-type: none"> Work accident due to PPE noncompliance Speedy project heavy machineries Improper covering of pointy maintenance materials. 	Negative Impact due to accident occurrence	High during long time negative impact

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
Risks on sensitive receptors	Agricultural land, shop owners, residencies, archaeology and cultural heritage	<ul style="list-style-type: none"> Disturbance of surrounding inhabitants with noise and dust emissions Improper waste disposal Soil erosion Possible temporary block of accessibility 	Negative impact due to close proximity of location to sensitive receptors	High, since agricultural activities are highly prevalent in Baalbek and given the Baalbek temple's close proximity to the project location

5.2 Potential positive impacts during maintenance

During maintenance, the project is expected to have positive impacts on socioeconomics. Being labor intensive, construction projects will result in job creation and in business opportunities for skilled and unskilled labor among residents and Syrian refugees, such as construction labor and the supply of construction material and provision of food to the construction workers. Based on the experience of construction work in the country, there is a higher probability of Syrians-refugees to apply and work in unskilled and low-skilled labor positions. The number of jobs created for roads maintenance within the Baalbek Caza could not be estimated at this stage, however, compared to other similar projects, the project shall require between 20 and 30 labors, 2 Forman, 2 Engineers and 2 skilled drivers on daily basis.

5.3 Potential positive impacts during the operation phase

Table 5-2 Environmental and Social Positive Impact for the Baalbek district roads during the operation phase

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
Environmental Impact				
Air quality & Traffic	Surrounding Communities, Fauna and Flora, and Water resources.	Improve traffic flow that led to improved fuel efficiency and better engine performance,	Positive impact due to reducing vehicle emissions Dust Emission	Major positive impact
Noise	Surrounding Communities, and Fauna.	<ul style="list-style-type: none"> Reduce traffic congestion Higher risk of noise production 	<ul style="list-style-type: none"> Positive impact by reducing stress on local inhabitants 	Moderate negative to positive impact
Water and soil quality	Surrounding Communities, Fauna and Flora, and Water resources.	Improve the water drainage collection system	Positive impact protection of water resources and soil.	Major positive during long time impact
Landscape and visual intrusion	Surrounding Communities	<ul style="list-style-type: none"> Elimination of road holes, falling retaining walls and improving stress lights and guardrails Sourcing maintenance material from unlicensed quarries 	<ul style="list-style-type: none"> Positive impact due to the road refurbishment to improved appearance Negative due to increased raw materials depletion, and dust, noise, and 	Moderate negative to positive impact

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Rating</i>
			vibrations generation	
Social Impact				
Traffic	Surrounding Communities and road users, and workers	Reducing traffic congestion	Positive Impact due to reducing traffic travel time.	High during long time positive impact
Socio-economic impacts	Surrounding Communities and road users	<ul style="list-style-type: none"> Improve accessibility of people (including school and university students), goods and services Reduced trip times and less traffic congestion Smoother road surfaces may lead to fewer vehicle repairs 	Positive Impact due to improvement in local economic and social development and enhanced livelihood opportunities	Positive
Health and safety impacts	Surrounding Communities and road users, and workers	<ul style="list-style-type: none"> With proper maintenance and signage, the roads can be safer with less potential for accidents With improved road conditions, the vehicle speeds increase 	Negative to Positive Impact in accident occurrence	Moderate negative to positive

5.4 Summary of impact analysis

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

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

Table 5-3 Summary of potential impacts of proposed roads in Baalbek district

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

	negative	Positive	
<i>Archaeology / Cultural Heritage</i>	Neutral		Neutral
<i>Expropriation/involuntary resettlement</i>	Neutral		Neutral

6 MITIGATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

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

6.1 Environmental and Social Mitigation Measures during maintenance

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

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Mitigation Measure</i>
Environmental				
Air quality	Surrounding Communities, Fauna and Flora, and Water resources.	<ul style="list-style-type: none"> Usage of maintenance equipment Shallow excavation Levelling works Transport vehicles delivering maintenance materials, Disturbances of stockpiles by winds and material handling 	Negative impact from Dust Emission	<ul style="list-style-type: none"> Ensuring adequate maintenance and repair of maintenance machinery and vehicles Maintaining good housekeeping practices Turning off all equipment when not in use Sprinkling water on the maintenance site on windy days Proper handling of cement material Covering all vehicles hauling materials Ensuring good fuel quality is used in trucks transporting maintenance material to and from site Ensuring optimum and regular transportation of maintenance materials to minimize storage of large heaps Restricting vehicle speeds to 15km/h on unpaved roads and trucks Ensure that all materials are sourced from licensed commercially operating quarries and asphalt and concrete batch plants. Proper storage of stock piles and coverage of loose materials.
Noise	Surrounding Communities, and Fauna.	<ul style="list-style-type: none"> Use of heavy machinery Excavation and milling works Labours shouting Evacuation of materials 	Negative impact creating stress on local	Use of quiet equipment and noise mufflers, proper maintenance of equipment, and limiting noisy activities to normal daylight working hours. The increased

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

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

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Mitigation Measure</i>
				<p>dissemination, mobile GRM signs and coordination with affected municipalities.</p> <ul style="list-style-type: none"> ▪ TMP (Traffic Management Plan) should be prepared by the contractor to include traffic detours and safety measures required to safely guide passing traffic, Pedestrian and Workers Safety beside the construction zone based on international standards and measures.
Existing infrastructure	Surrounding Communities	<ul style="list-style-type: none"> ▪ Cut-off water supply pipes ▪ Destruction of electricity cables or/and phone lines. ▪ Block of drainage channels and/or wastewater collection network 	Negative Impact due to possible loss of services	<ul style="list-style-type: none"> ▪ Avoid damaging any possible existing infrastructure and try to obtain plans prior to commencement of any maintenance works, in coordination with 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.
Social tensions	Surrounding Communities and workers	The feeling of discrimination or harassment due to hiring of foreign labours	Negative impact due to conflict over jobs or dissatisfaction	<ul style="list-style-type: none"> ▪ Keep close coordination with municipal authorities to avoid any tension escalation and provide working vacancy for local community ▪ Ensure requirements in CoCs are clearly understood. ▪ Ensure that the sanctions embodied in the CoC are be clearly explained. ▪ Verify that GRM is adequately implemented
Child labour	Refugee and poor communities	Allowing child to work in unsafe construction environment and preventing him the right of proper education	Negative Impact due to abuse and exploitation	Prevent any child labour and keep close monitoring to avoid any similar action
Labour conditions	Refugee and poor communities	<ul style="list-style-type: none"> ▪ low wages, ▪ absence of social security and employment benefits ▪ unequal job opportunities 	Negative Impact due to possible abuse of rights	Provide workers with the right wages and job opportunities and keep close monitoring to prevent lack of social security and employment benefits
Labour Influx	Women and children	SEA/SH Verbal and/or action harassment	Negative Impact due to possible Sexual Abuse and Exploitation and Harassment (SEA/SH)	Provide workers with the necessary training and awareness raising session on issues regarding SEA/SH, prior to signing the CoC.
Health and safety impacts	Surrounding Communities	<p>Accidents/Incidents</p> <ul style="list-style-type: none"> ▪ Improper traffic management 	Negative Impact due	<ul style="list-style-type: none"> ▪ Work within work zone only

<i>Potential Impact</i>	<i>Receptor</i>	<i>Activity generating impacts</i>	<i>Impacts Description</i>	<i>Mitigation Measure</i>
	and road users (The Public)	<ul style="list-style-type: none"> ▪ Land obstacles and uncovered holes ▪ Increased vehicle speed due to new good road condition ▪ 	to accident occurrence	<ul style="list-style-type: none"> ▪ Comply with the standard safety, health and environmental regulations of the CDR and the WB. ▪ Installing proper warning signs, ▪ Providing personnel protective clothing and equipment PPEs. ▪ Making the Bank team aware of an incident occurrence within 24 hours. ▪ Developing Public Health and Safety Plans ▪ The increased vehicle speed and noise will require speed limitation methods such as speed bumps
	Workers	<ul style="list-style-type: none"> ▪ Work accident due to PPE noncompliance ▪ Speedy project heavy machineries ▪ Improper covering of pointy maintenance materials. 	Negative Impact due to accident occurrence	<ul style="list-style-type: none"> ▪ Developing Occupational Health and Safety Plans ▪ Work within work zone only ▪ Providing personnel protective clothing and equipment PPEs. ▪ Making the Bank team aware of an incident occurrence within 24 hours.
Risks on sensitive receptors	Agricultural land, shop owners, residencies, archaeology and cultural heritage	<ul style="list-style-type: none"> ▪ Disturbance of surrounding inhabitants with noise and dust emissions ▪ Improper waste disposal ▪ Soil erosion ▪ Possible temporary block of accessibility 	Negative impact due to close proximity of location to sensitive receptors	<ul style="list-style-type: none"> ▪ Extra precautions taken in the vicinity of archaeological sites and residencies to not cause disturbance, in terms of frequency, intensity and timing of works ▪ Prevent road closure ▪ Monitoring air and noise emissions, and waste generation to not affect nearby agricultural lands

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

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

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

<i>Impact</i>	<i>Monitoring indicators</i>	<i>Responsibility</i>	<i>Frequency/ Duration</i>	<i>Location</i>	<i>Methods</i>	<i>Estimated Cost¹</i>
<i>Traffic</i>	Periodic site inspection by traffic expert with documentation and photos of mitigation measures (traffic management plan-TMP)	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	TMP experts employment salary of about \$1,500/month salary
<i>Air quality</i>	Periodic site inspection by EHS expert with documentation and photos of mitigation measures (vehicle and excavation emissions, turning off of equipment not in use, equipment maintenance, etc.)	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	Total Suspended Particles (TSP), PM ₁₀ , PM _{2.5} (wherever feasible), SO _x , NO _x and CO	Contractor under supervision of the Consultant	Upon public complaint	At site and at sensitive receptors within 100 m from site	Visual inspection and maintenance logs checking	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
<i>Noise</i>	Periodic site inspection by EHS expert with documentation and photos of mitigation measures (equipment mufflers, equipment maintenance, equipment turned etc.) and measurements of indicators in case of public complaints	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month

Impact	Monitoring indicators	Responsibility	Frequency/ Duration	Location	Methods	Estimated Cost¹
	L_{eq} , L_{min} and L_{max}	Contractor under supervision of the Consultant	Upon public complaint	At site and at sensitive receptors within 100 m from site	If there are community complains, measurement may take place. Single sample per location (average 1hr reading-15min intervals) during morning (7-8am), evening (1-2pm) and night (4-5pm)	500\$/ event
Maintenance and other Solid waste	Periodic site inspection by EHS expert with documentation while maintaining a record of waste generation, collection, segregation, storage, transportation and disposal in terms of type, quantity, and disposal location of generated waste	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
Runoff water/ drainage	Periodic site inspection by EHS expert with documentation	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	Water quality analysis	Contractor under supervision of the Consultant	Upon public complaint	At nearby seasonal river/ stream	Totals suspended solids, BOD, COD, Oil and grease	1000\$/ event
Resource consumption	Periodic site inspection by EHS expert with documentation of excavated material, water and energy conservation practices and design elements	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
Existing infrastructure	Periodic site inspection by EHS expert with documentation of excavation works and response to disruption of underground utilities	Contractor under supervision of the Consultant	Daily	At maintenance site	Coordination with municipalities	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
Visual intrusion	Periodic site inspection by EHS expert with documentation of excavation and re-planting / re-vegetation while checking on culverts particularly	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of

Impact	Monitoring indicators	Responsibility	Frequency/ Duration	Location	Methods	Estimated Cost¹
	following rainfall events					about \$2,500/month
<i>Health and Safety</i>	Checking accident logs and ensuring proper recording of all incidents including near-misses	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month Each road has one full time officer
<i>Socio-economic</i>	<ul style="list-style-type: none"> Periodic site inspection by EHS expert with documentation of employment and grievance, sharing maintenance schedule with the public, access to roadside businesses, vendors and residences, and grievance record. Documentation of training and raising awareness for SEA/H and signing of the CoC as well as record of age verification against child labor. 	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	<ul style="list-style-type: none"> Labor working conditions 	Contractor under supervision of the Consultant	Daily	At maintenance site	Visual observation and documentation with photos	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	<ul style="list-style-type: none"> Monitoring community satisfaction. 	Contractor under supervision of the Consultant	Daily	At maintenance site	The site engineer receives community complaints (if any)	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month
	<ul style="list-style-type: none"> In case of operational SEA/SH violation 	Contractor under supervision of the Consultant	Daily	At maintenance site	The site engineer receives community complaints (if any)	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month

<i>Impact</i>	<i>Monitoring indicators</i>	<i>Responsibility</i>	<i>Frequency/ Duration</i>	<i>Location</i>	<i>Methods</i>	<i>Estimated Cost¹</i>
	<ul style="list-style-type: none"> In case of public SEA/SH violation 	Contractor under supervision of the Consultant	Daily	At maintenance site	The site engineer receives community complaints (if any)	Environmental, Health & Safety, and Social EHS expert employment salary of about \$2,500/month

7.1.1 Training

In the context of the proposed project, that encompasses simple maintenance activities, environmental management during the maintenance and operation activities are relatively simple to ensure environmental protection. This can be accomplished through competent personnel with appropriate educational and professional background and instituting a periodic training program and site-specific plans that are adequate for protecting the general public and the environment as well as contributing to the mitigation of potential environmental impacts. Thus, contractor's personnel who will be involved in the maintenance of the proposed project as well as personnel who will be involved in monitoring activities from the supervising Consultant may attend an environmental training workshop prior to the initiation of project activities. Relevant staff from the concerned municipalities are encouraged to attend, as they will be indirectly supervising the works on the ground. The objective of this training is to ensure appropriate environmental awareness, knowledge, and skills for the implementation of environmental mitigation measures. Environmental training sessions will be conducted twice a year for a period of one day during the maintenance phase. The training program will emphasize on pollution prevention measures and techniques during both phases, Health and Safety and implementation of TMP. The cost and schedule of this training program will be 1,000 USD per day including material preparation. Repeat workshops will be at 500 USD per day.

The training will include Social risk management besides the Environmental risk management.

The training program will cover the following topics:

- GRM
- SEA/SH
- Codes of conduct
- OHS, etc.

7.1.2 Reporting

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

- ❑ Contractor's environmental compliance reports to the Environmental Supervision Consultant on monthly basis.
- ❑ Environmental Supervision Consultant reviews and approves the contractor reports and submits to the PIU at the CDR Roads and Transport Department on monthly basis
- ❑ PIU environmental/social progress reports to the WB, on a quarterly basis.
- ❑ In case of serious and severe accidents, root cause analysis (RCA) should be developed by the Contractor, reviewed by the Engineer and approved by CDR.

7.1.3 Documentation and Reporting

During the maintenance phase, the Supervising Consultant shall submit a monthly report about the monitoring activities to various stakeholders including the CDR. The content of a typical report should mirror the indicators of the mitigation plan with proper documentation with photos and actions taken in the event of accidents, concerns or complaints.

7.1.4 Guidelines for Health and Safety Plan during maintenance

During maintenance, the contractor shall abide by the CDR Safety, Health, and Environmental Regulations for Construction Projects as well as the WBG Environmental Health and Safety General Guidelines. Also, the contractor should develop and implement detailed HS plan under supervision of the Engineer.

8 CONSULTATION, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

8.1 Public Consultation

Project-affected groups, mainly municipalities and local NGOs were consulted on the project's environmental and social aspects.

This ESMP was publicly consulted where a public meeting was arranged for Baalbek Caza and was held at Baalbek Municipality on Thursday August 24, 2023. None of which were women, while three women attended the online meeting.

PAPs were not consulted at this stage due to the challenge of inviting local residents from all municipalities to the public meeting at Baalbek Municipality. However, it's important to note that those living and working near the affected road will be informed about the project activities, schedule, and GRM before it begins.

Invitations were sent by the consultant on behalf of CDR to concerned municipalities and NGOs through official letters, emails and direct phone calls. The invitation letter is attached in Annex 5. Invitations were sent to the concerned parties at least one week before the meeting date.

As for NGOs Consultation, this ESMP has targeted them via online meeting, on August 29, 2023, according to their position in Lebanon. They consist of two levels as follows:

- a) Local NGOs: they are specific to each Caza. Their mission is to address different concerns and issues among the local society including social, economic, gender equality, environment, poverty, women empowerment, etc. Local NGOs were invited to the public hearings. Unfortunately, they could not attend the public meeting which resulted in another scheduled online meeting. Tables 8-1 and 8-2 represent the names of the invited NGOs and their field of activity. Those local NGOs may play a role of advocates to reduce projects' social and environmental risks.

Table 8-1 List of Contacted Local NGOs

Organization	Contacts	Activities	Feedback
Kafa	kafa@kafa.org.lb	KAFA (enough) Violence & Exploitation is a feminist, secular, Lebanese, non-profit, non-governmental civil society organization seeking to create a society that is free of social, economic and legal patriarchal structures that discriminate against women.	They requested explanation concerning grievance action mechanism and what methodology to submit. Also, explanation on the type of maintenance works and the possibility of increasing the items and volumes for works.
Himaya	himaya@himaya.org 01 395 315	Himaya was founded in 2008 with the notification number 748/2009. The organization has continued to grow, responding to child protection needs on a national level.	The answer was that there is no possibility of increasing project activities due to

Lost	media@lostlb.org	Lebanese NGO that works with people, particularly women and youth to create a more developed and equitable society through reducing poverty, eliminating exclusion, and fostering a culture of peace.	constraints in terms of budget and time.
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- 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.

Table 8-2 Consulted International NGOs and their Activities

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

			including Beirut, Tripoli, Kobayat and Zahle. He welcomed the idea of the Project and will disseminate it across his organization.
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During the public participation, project details and design, impacts and mitigation measures were presented in a 35-minute presentation (see more details in Annex 5), which has followed by an open discussion with the attendees. In particular, the consultant informed the attendees about the project objectives, the identified natural, economic, and social resources of importance in the area, the project's possible environmental and social risks, the project GRM mechanism and the planned mitigation measures. The GRM was communicated to all attendees. Potential complaints from work activities can be sent to CDR in the context of the project GRM mechanism.

The main attendees of the meeting were namely the heads of concerned municipalities, citizens and relevant local NGOs (refer to the lists of attendees in Annex 5).

The presidents of the municipalities belonging to the municipalities' union of Baalbek insisted on the necessity that the project includes other villages that did not benefit from the project's first stage which constitutes the rehabilitation and maintenance of primary roads in several villages. For example, the representative of Majdaloun municipality stated that the main road there has huge export companies that have high economical potential that is inhibited by the current quality of the road. As it was mentioned, the asphalt is old and the width is too tight.

Additionally, there were requests that the secondary roads of the villages concerned in the project, be taken into consideration as they are also in need of maintenance. Finally, the NGOs that were present in the meeting expressed their wish to cooperate on this project.

It is to be noted that, concerning the municipalities union of each of Deir E Ahmar, Al Challal, South of Baalbek, Chlifa and West Baalbek, the public participation meetings could not be held due to the outbreak of the war in Lebanon in October. As a result, authorization for the meetings was not granted.

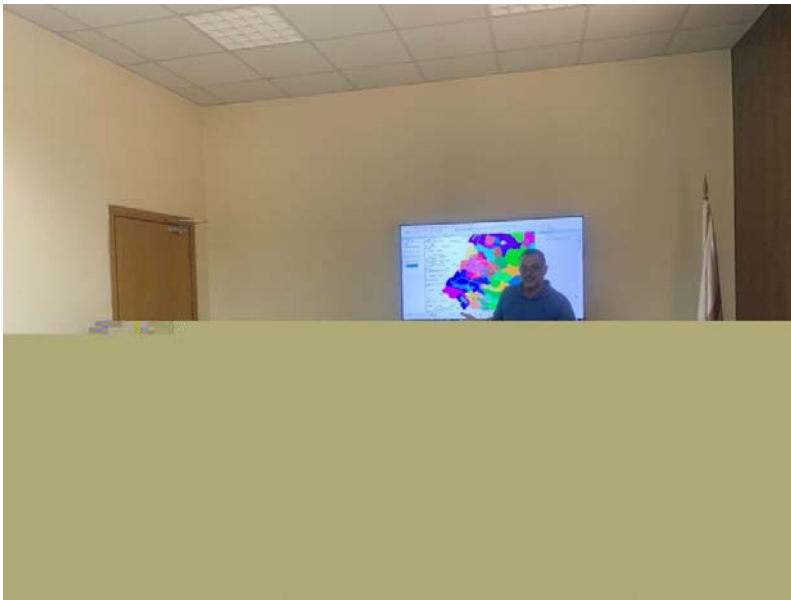


Figure 8-1 Public hearing session at the Union of Baalbek Municipalities

Disclosure

It is to be noted that the residences and commercial units near the concerned road will be made aware of the project activities, schedule and GRM prior to commencement.

8.2 Grievance Redress Mechanism

8.2.1 GRM for Communities

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

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

The GRM levels of the project are the following:

- Level 1: If any person has any complaint 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 (immediate investigation shall be carried out and corrective actions shall be taken in case of issues assessed as critical).
- 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. The contact details are made available to the public by being presented on the project and mobile sign boards.
 - 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. Citizens can also register an official letter at the CDR (Address: Tallet al Serail - Riad el Solh, Beirut – Lebanon).

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

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

The Complaints Register form (refer to Annex 6) includes the following:

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

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

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

8.2.2 GRM for Workers

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

one week. The second level involves reporting to the PMU Director and should be resolved within one week. It also follows the Complaints Register form (refer to Annex 6).

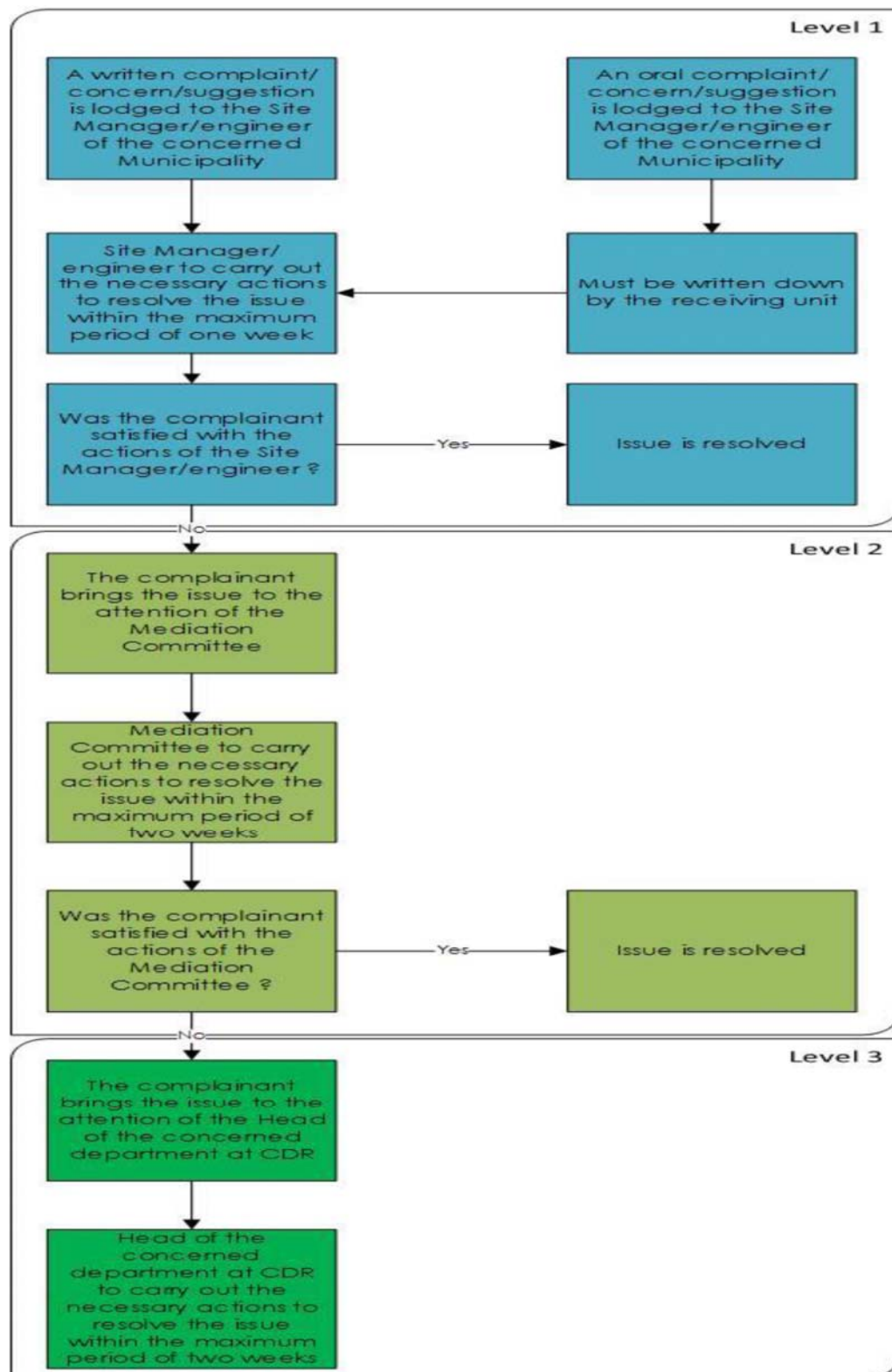


Figure 8-2 Typical grievance redresses mechanism for the REP

Source: CDR, 2018

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ANNEX

Annex 1: Figures and Tables Related to Chapter 4

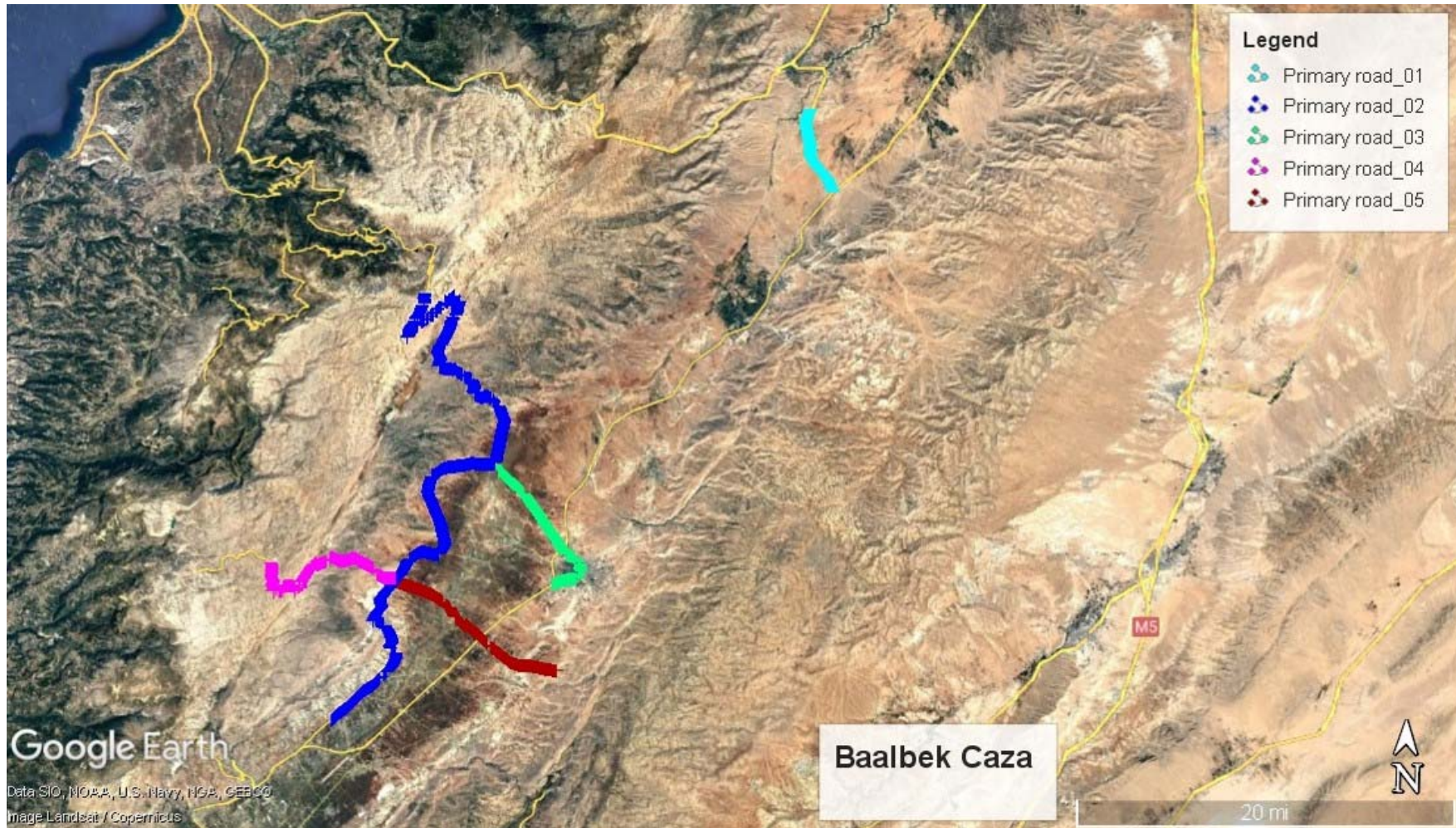


Figure A Satellite image of the Hermel primary road (source: Google Earth)

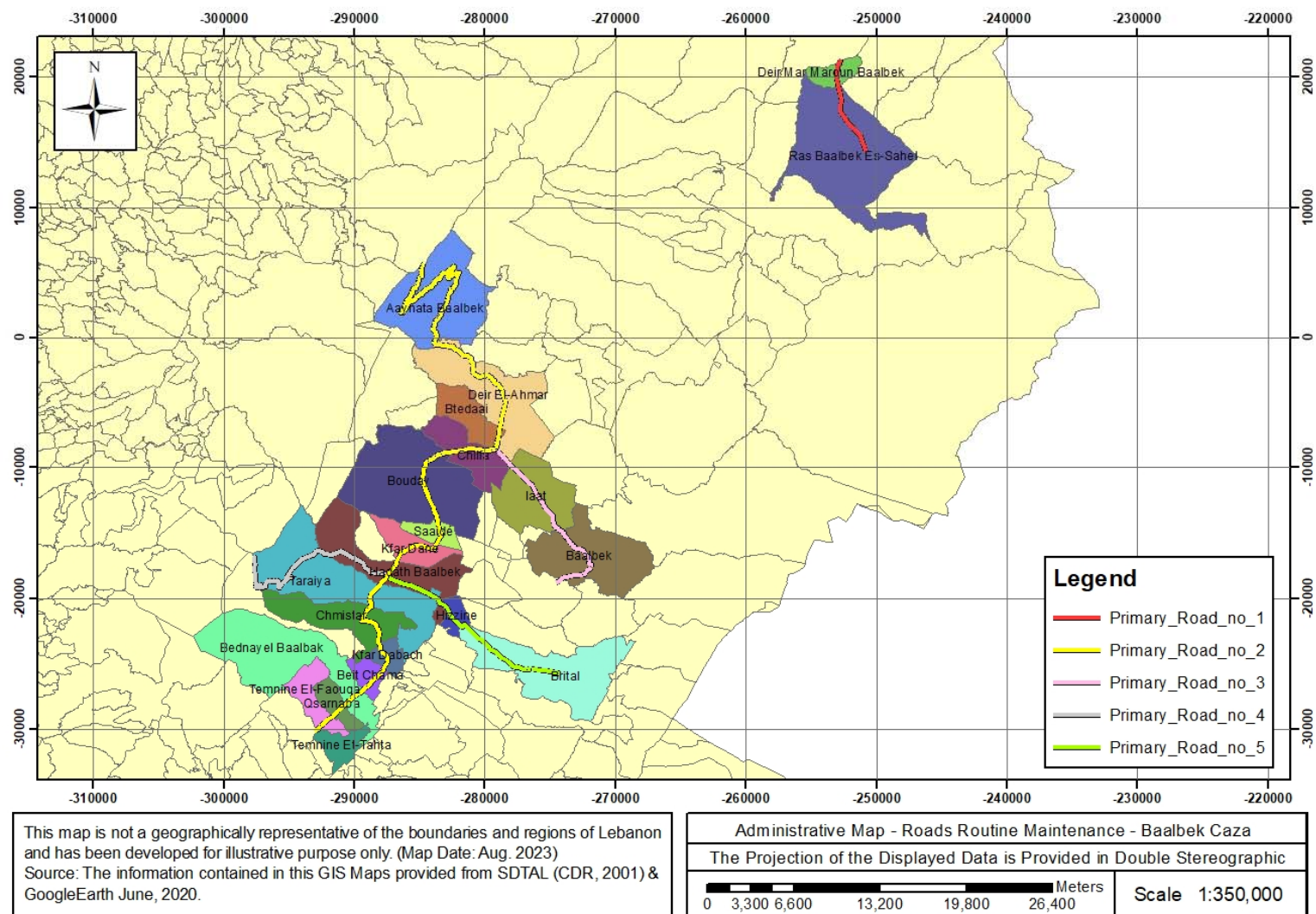


Figure B Administrative Map

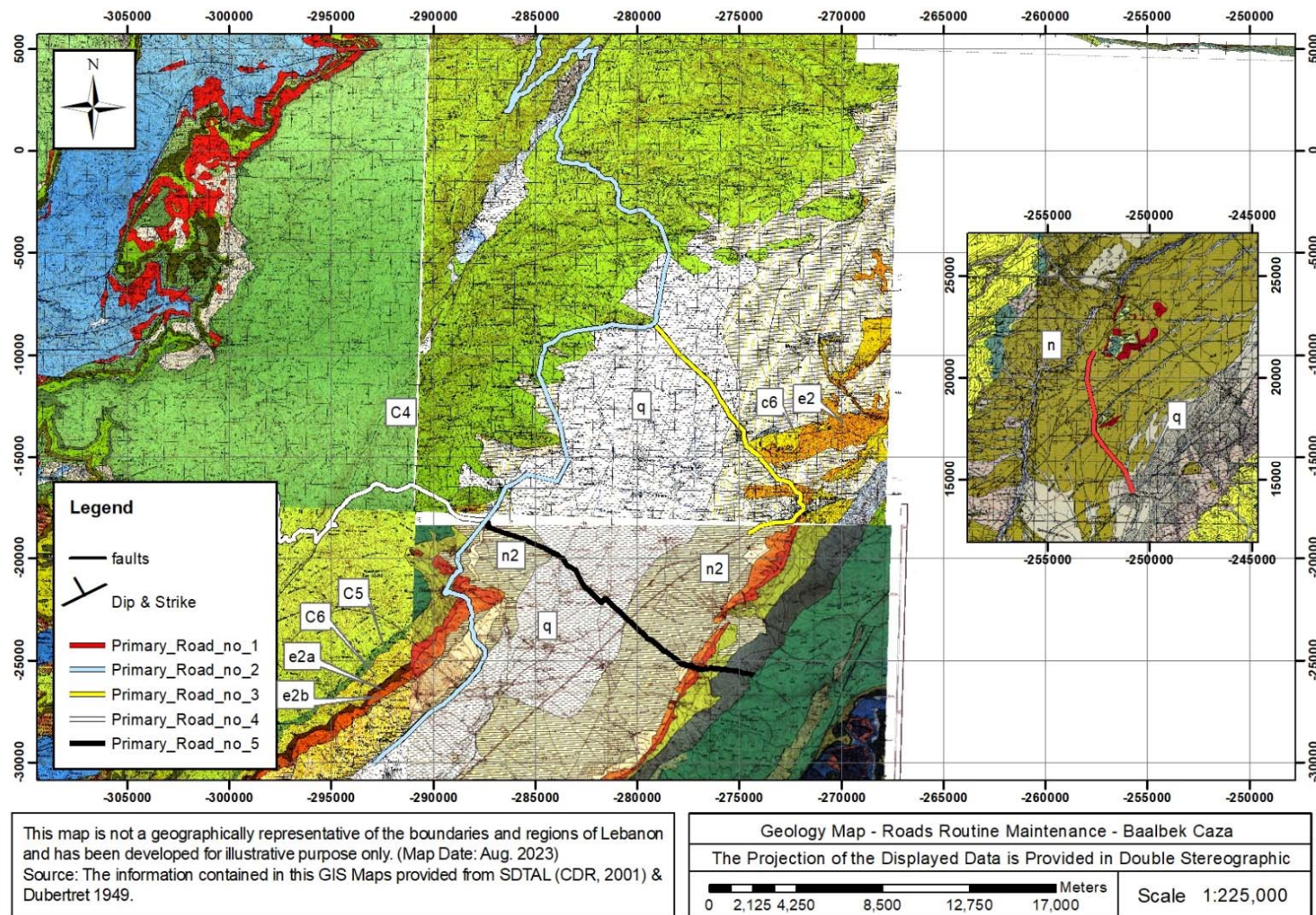


Figure C Geology Map

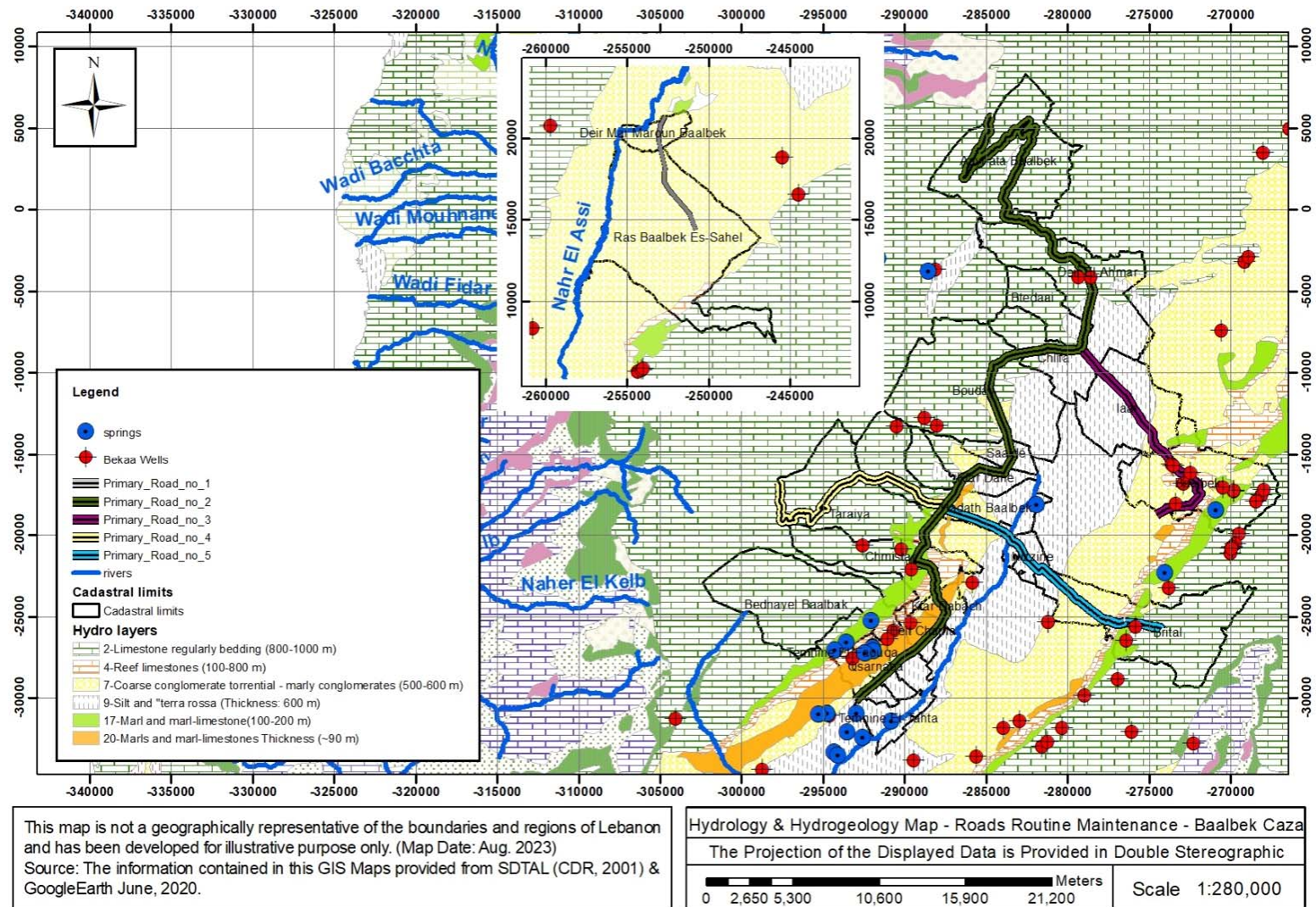


Figure D Hydrology and Hydrogeology Map

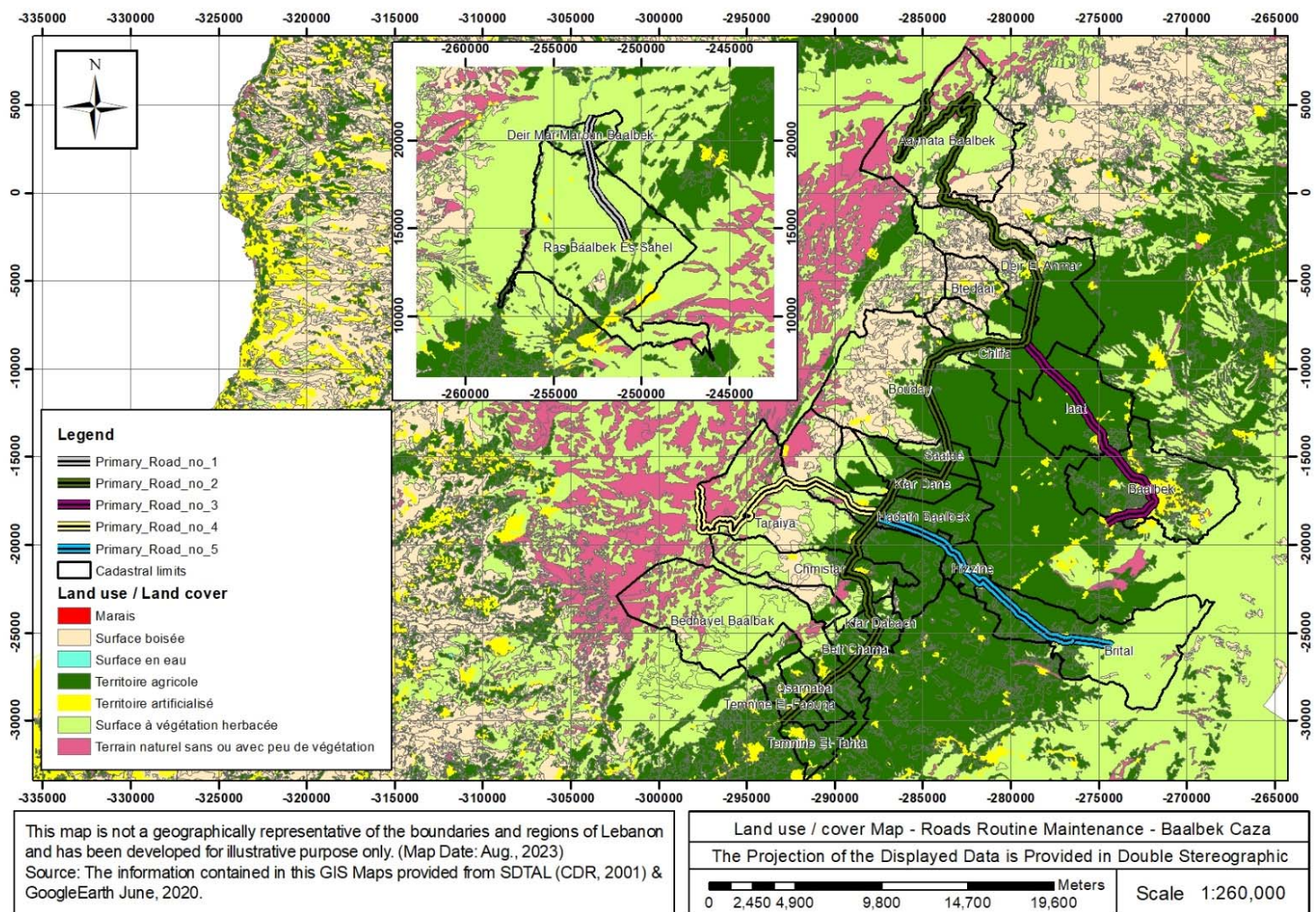


Figure E Land use / cover map

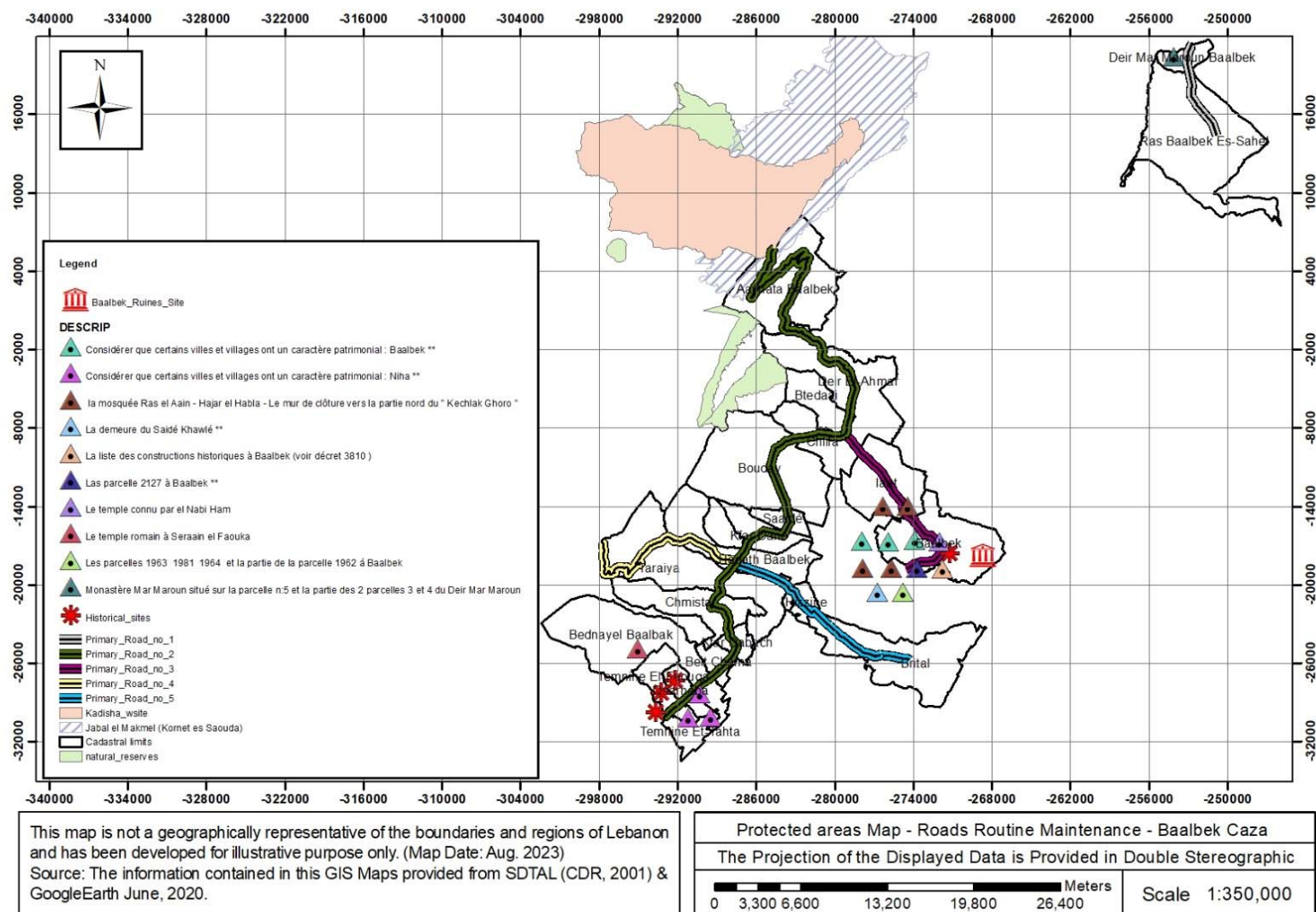


Figure F Protected areas map (source: CDR, DAG, & Dubertret; processed by Geoflint)

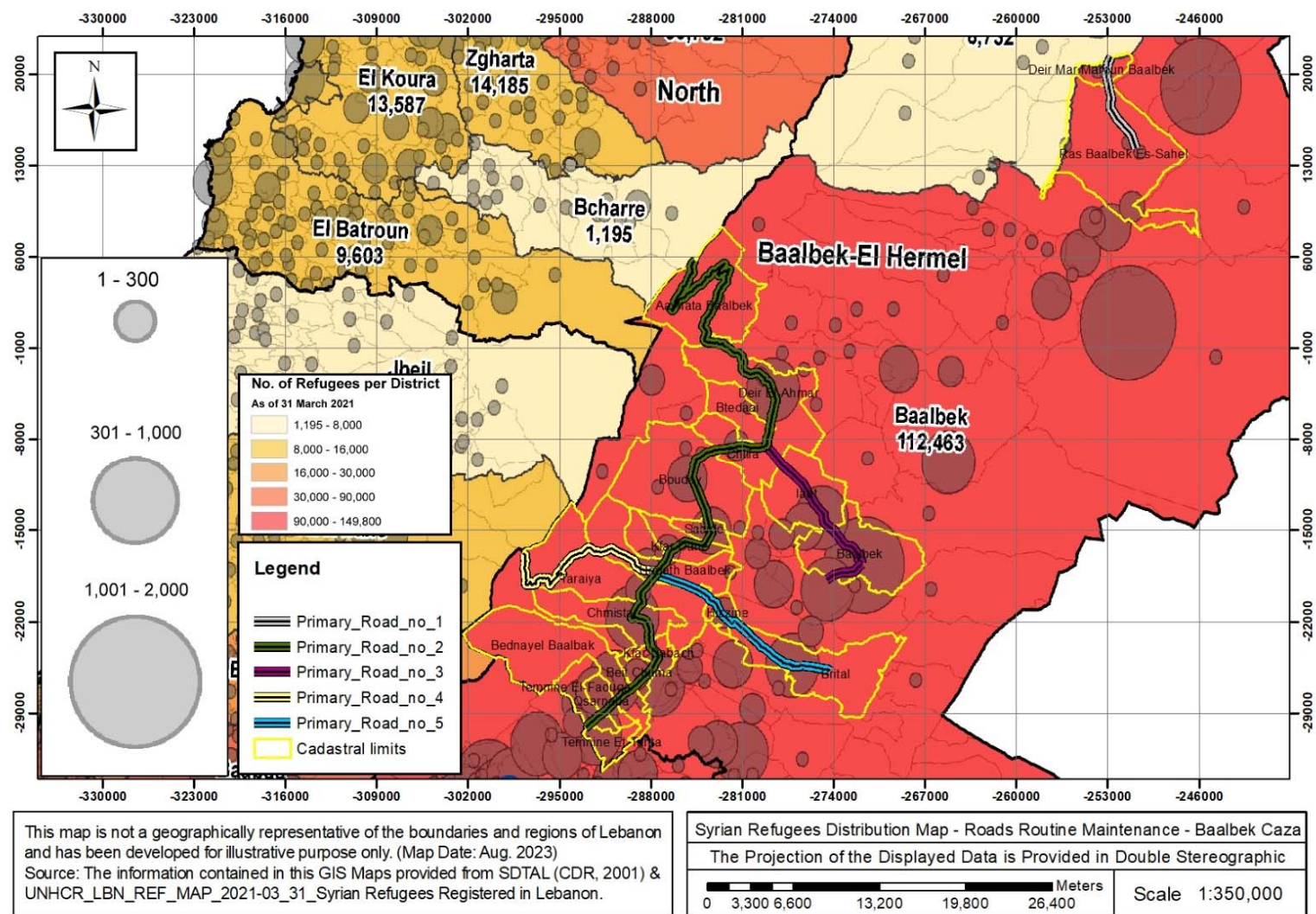


Figure G Syrian Refugees Distribution Map (source: CDR, DAG, & Dubertret; processed by Geoflint)

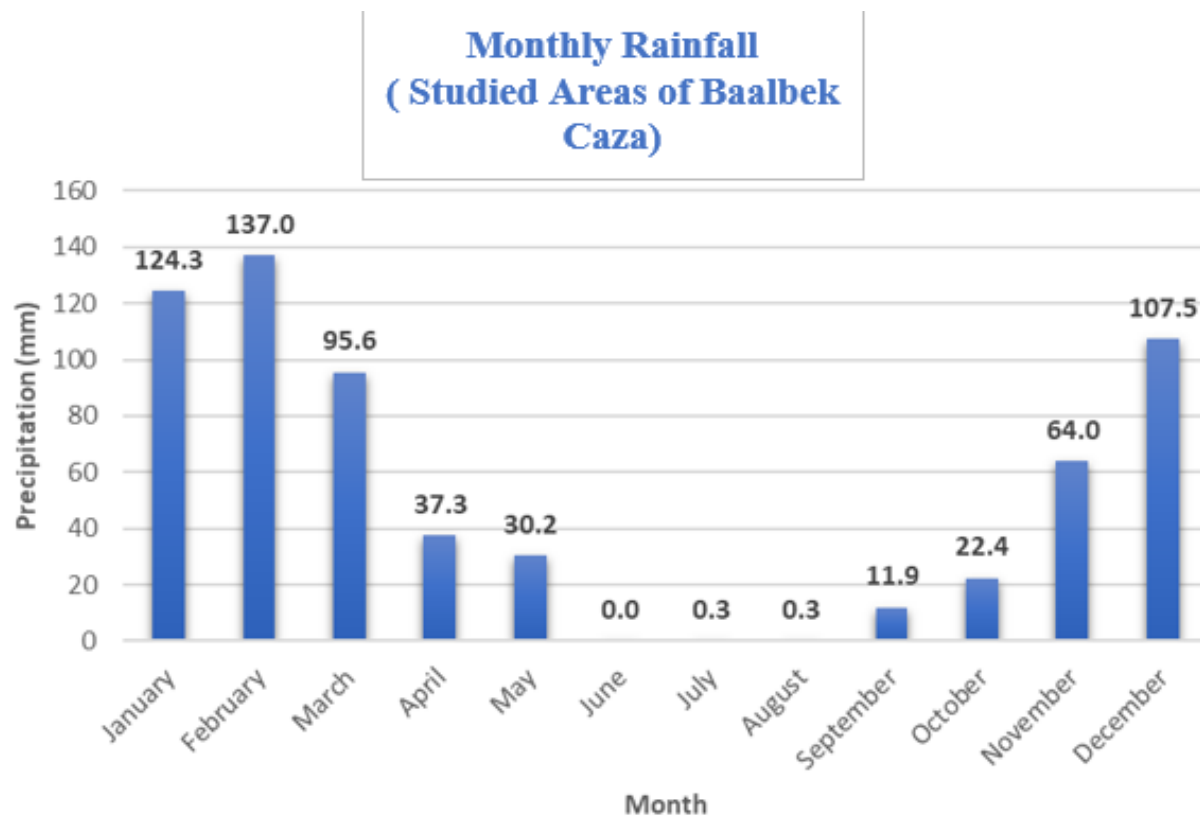


Figure H Precipitations values along all studied roads (period extending between 1996-2018) CHIRPS satellite 4.5 km spatial resolution
(Source: CHIRPS satellite)

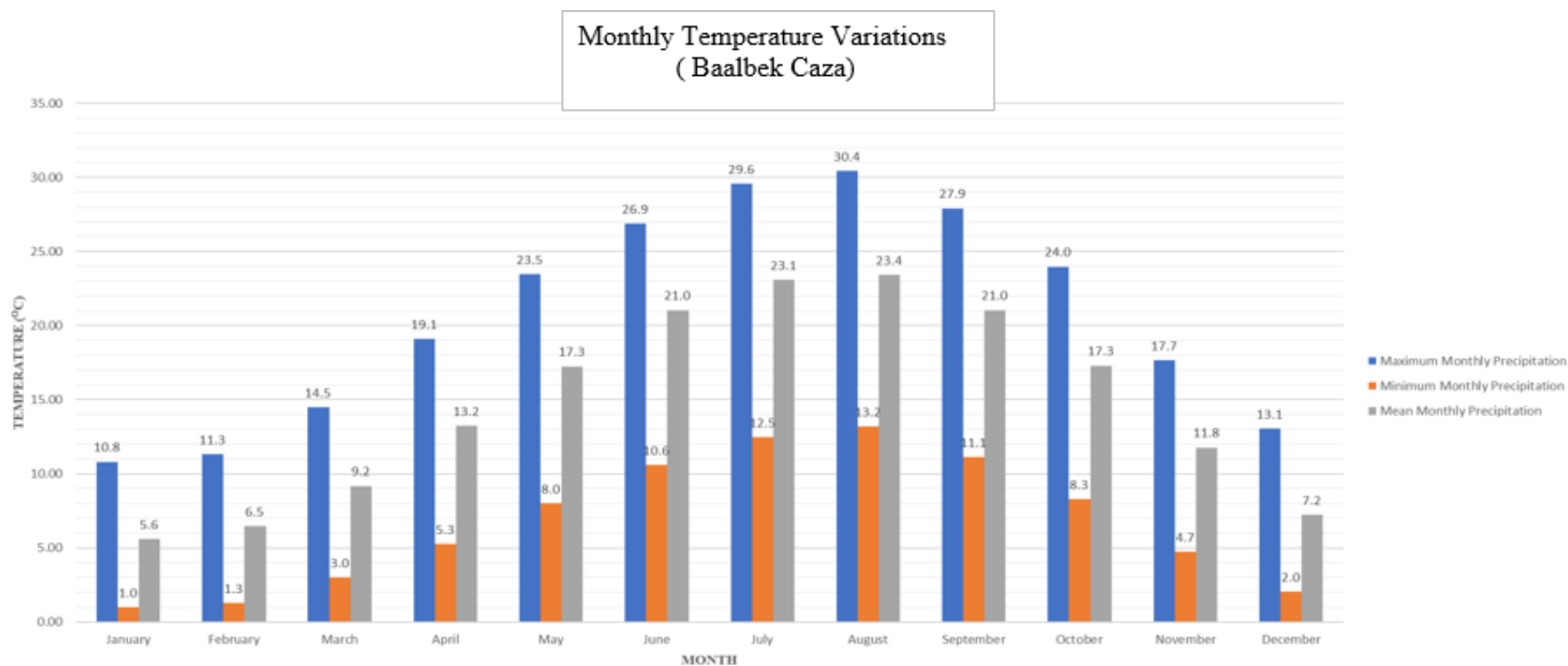


Figure I Land surface temperature variation for all studied roads (period extending between 2000-2018) MODIS satellite 1km spatial resolution
(Source: MODIS satellite)

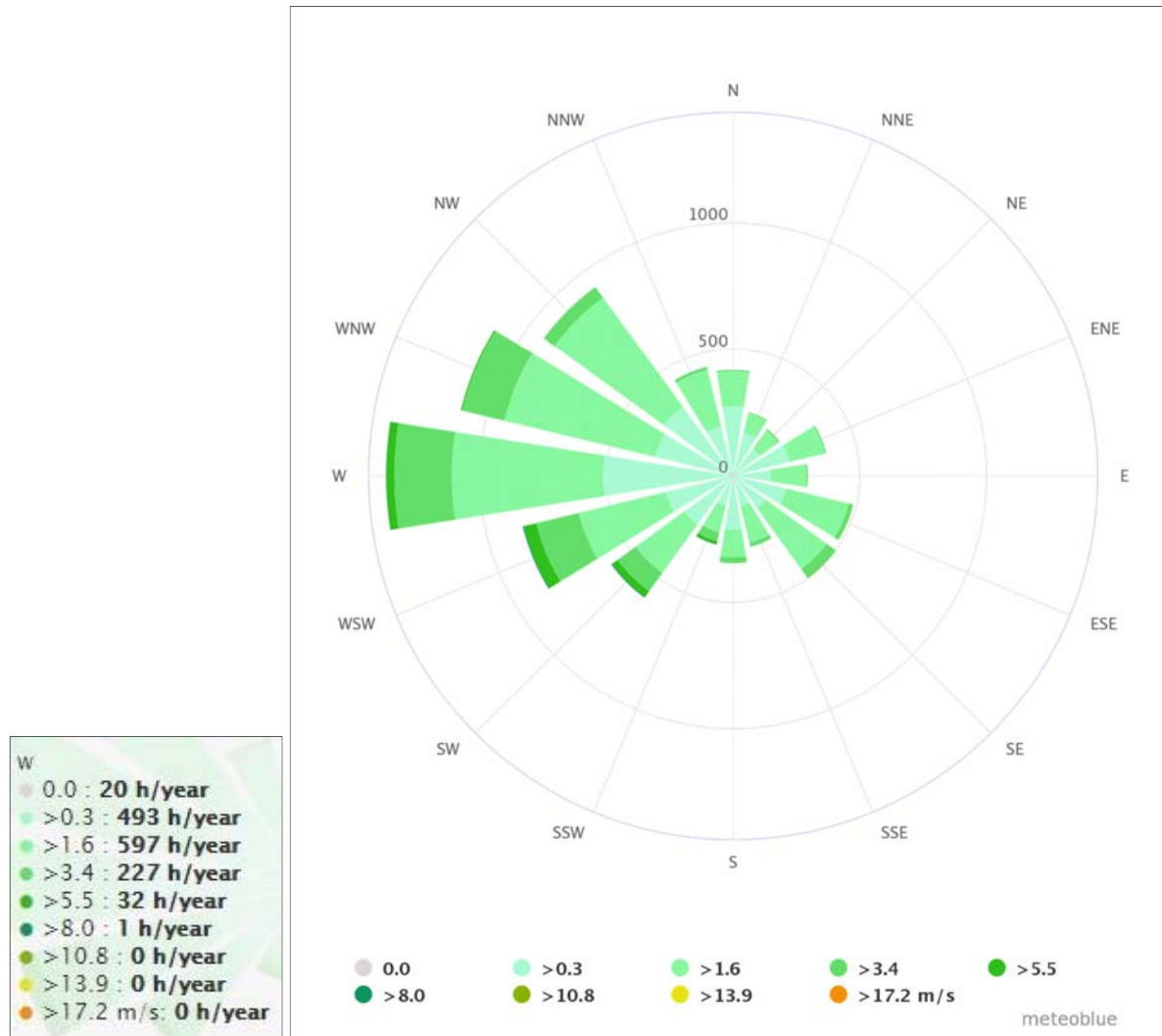


Figure J Windrose diagram Baalbek Caza (wind direction, speed, and frequency, Source: Meteoblue prognostic model)

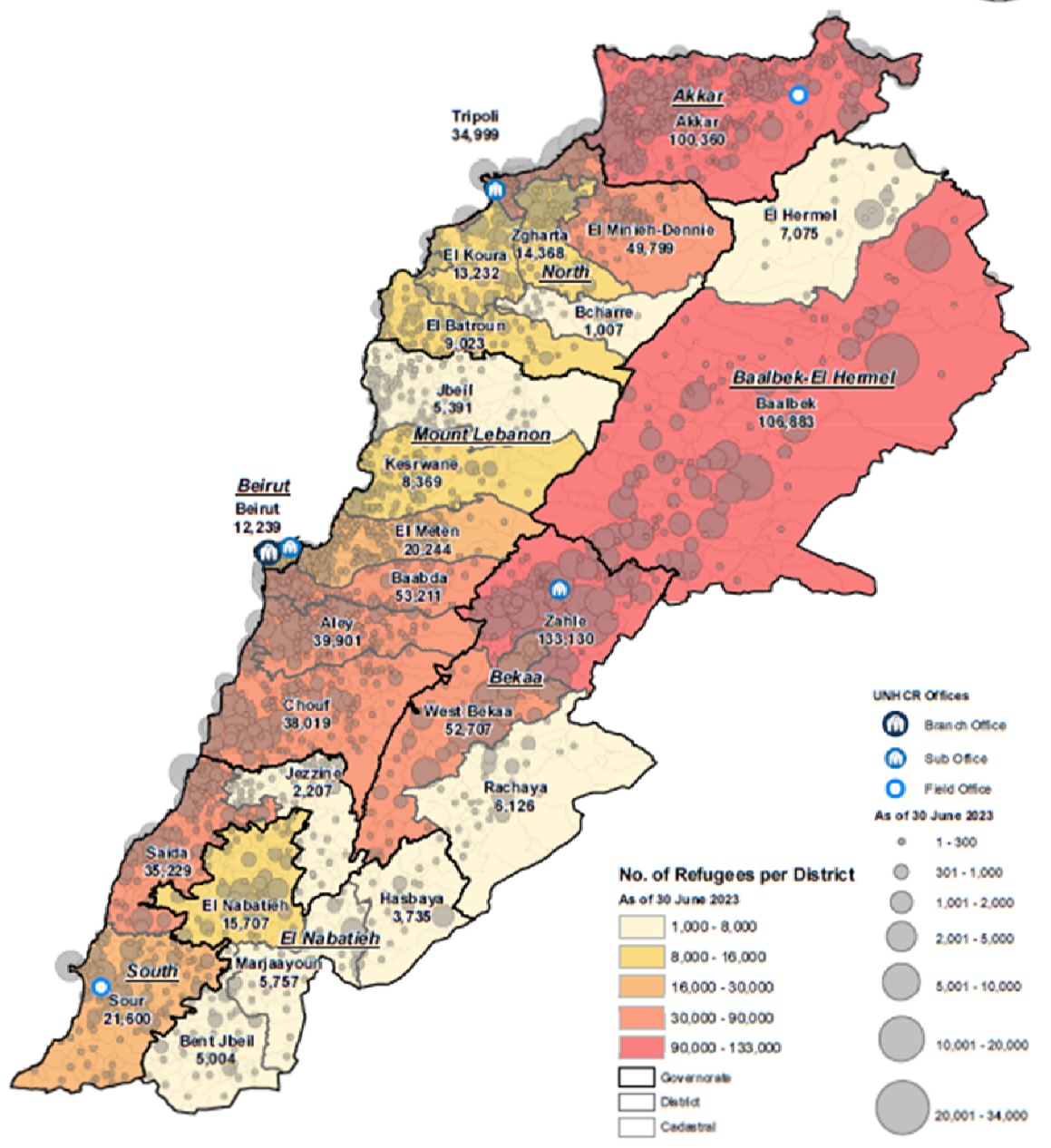


SYRIA REFUGEE RESPONSE LEBANON, Syrian Refugees Registered

30 June 2023



Total No. of Refugees **795,322**



This map has been produced by the Inter-Agency Information Management Unit of UNHCR based on maps and material provided by the Government of Lebanon for operational purposes. It does not constitute an official United Nations map. The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Data Sources

- Refugee population and location data by UNHCR as of 30 June 2023. For more information on refugee data, contact Diana El-Habib at elhabid@unhcr.org

GIS and Mapping by UNHCR Lebanon. For further information on maps, contact Maroun Sadeh at sadeh@unhcr.org

Figure K Syrian Refugees Map in Lebanon (UNHCR, 2023)



Figure L Refugee camps location in Saaide



Figure M Refugee camps location in Deir El Ahmar



Figure N Refugee camps on the way to Deir El Ahmar center



Figure O Refugee camps near the road leading to Iaaf



Figure P Air quality cells for the studied roads



Figure Q Cultivated trees and degraded grasslands bordering primary road-02



Figure R Residential units on the road side



Figure S Baalbek Temple found at about 50m distance from road 03



Figure T Baalbek thermal power station along road 03



Figure U Al Mortada High-school



Figure V Deir El Ahmar town



Figure W Saint Joseph Church in Deir El Ahmar



Figure X Deir El Ahmar Medical Center



Figure Y Ainata (Arez-Baalbek Road)



Figure Z snow touristic attraction in Nessef el Batrak -Bsharri



Figure A' Baalbek road (from Chlifa To Ainata)



Figure B' Historical Landmark of Baalbek Roman Ruins



Figure C' Al Waleed Amawi Mosque in Baalbek



Figure D' Sayyida Khawla Shrine

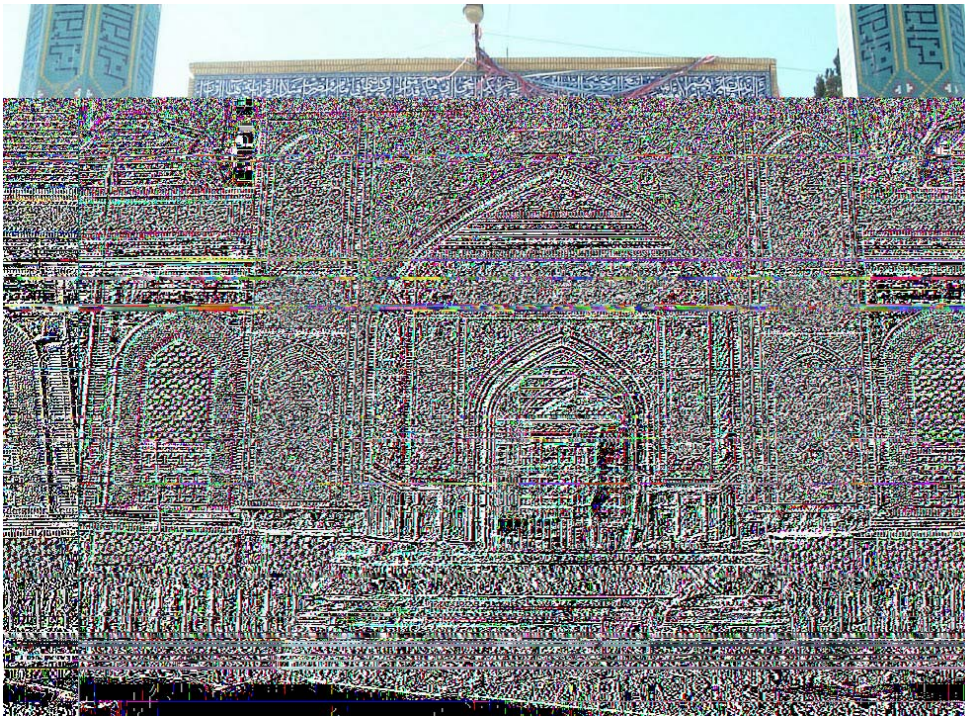


Figure E' the grand Shiite mosque of Baalbek



Figure F' Imam Mahdi Mosque

Annex 2 Assessment Methodology

The assessment followed the Lebanese MoE grading methodology stated in Decree 260/1, 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 rehabilitation and operational phases. The stages of the evaluation process are the following:

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

Impacts are first classified as shown the table below:

Table A Classification of impacts

Matrix	Classification	Criteria
N (Nature)	P (Positive)	<ul style="list-style-type: none"> The proposed activity offers benefits for the overall project
	N (Negative)	<ul style="list-style-type: none"> Impacts having minimal to major negative influence
	D (Direct)	<ul style="list-style-type: none"> Impact arising directly from the project activities
	I (Indirect)	<ul style="list-style-type: none"> Impacts arising from activities not directly related to the project development
M (Magnitude)	L (Low)	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> 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

Matrix	Classification	Criteria
	H (High)	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> Limited to the project area Locally occurring impact within the locality of the proposed project
	G (Global)	<ul style="list-style-type: none"> Extend beyond the local area National impact affecting resources on a national scale
T (Timing)	S (Short-term)	<ul style="list-style-type: none"> Activities and their related impacts are characterized by a short duration of effect
	M (Medium-term)	<ul style="list-style-type: none"> Activities and their related impacts are characterized by a medium duration of effect
	L (Long-term)	<ul style="list-style-type: none"> Activities and their related impacts are characterized by a long duration of effect
D (Duration)	C (Construction)	<ul style="list-style-type: none"> Impacts arise during the construction phase of the proposed project
	O (Operation)	<ul style="list-style-type: none"> Impacts arise during the operational phase of the project
R (Reversibility)	R (Reversible)	<ul style="list-style-type: none"> Impacts may be reversible, or able to be rehabilitated upon the decommissioning of the proposed project
	I (Irreversible)	<ul style="list-style-type: none"> Impacts may not be reversible, or able to be rehabilitated upon the decommissioning of the proposed project
L (Likelihood of occurrence)	L (Low)	<ul style="list-style-type: none"> The classified impact is unlikely to occur under normal operating conditions
	M (Medium)	<ul style="list-style-type: none"> The classified impact may possibly occur
	H (High)	<ul style="list-style-type: none"> The classified impact is unlikely to occur under normal operating conditions
S (Significance)	L (Low)	<ul style="list-style-type: none"> Results in no substantial adverse change to existing environmental conditions
	M (Medium)	<ul style="list-style-type: none"> Substantial adverse change to existing environmental conditions Can be mitigated to less-than-significant levels by implementation of proposed potentially feasible mitigation

Matrix	Classification	Criteria
		measures or by the selection of an environmentally superior project alternative
	H (High)	<ul style="list-style-type: none"> 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:

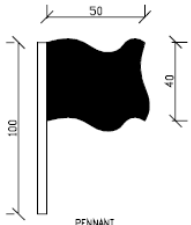
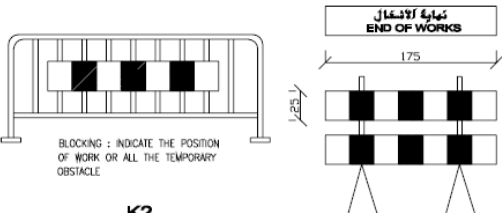

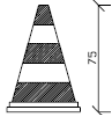
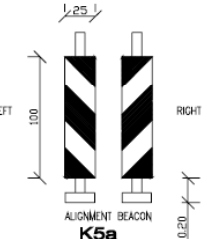
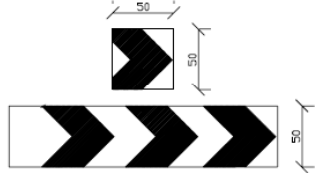
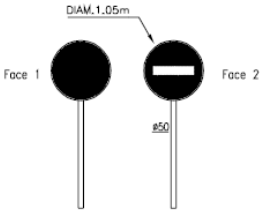
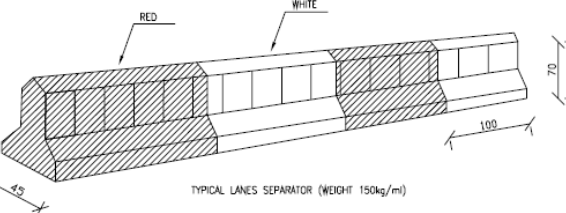
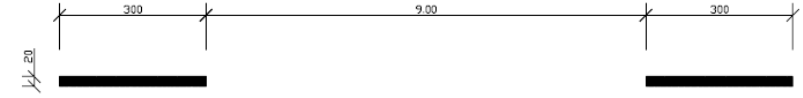
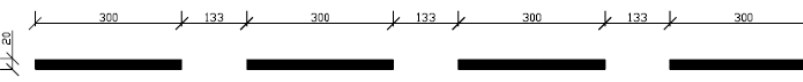
1. Attributes relevant to the project are chosen
2. Weights or numerical values are assigned to each attribute depending on its importance (values should be based on objective data or expert opinion to exclude subjectivity during the process).
3. Scores are allocated to each option to reflect its status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

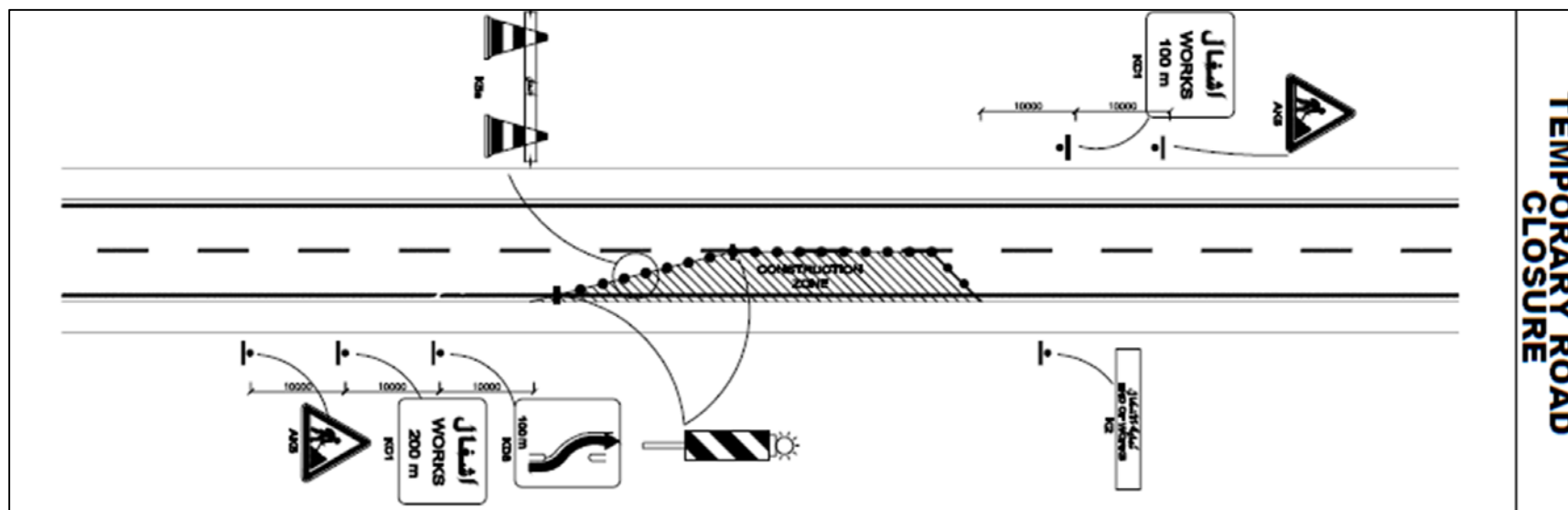
The final result is a single weighted score for each option, which is used to quantify its overall performance/significance. As such, the adopted matrix is designed to allow subjective conclusions to be numerically recorded or quantified, therefore providing at the same time an impact evaluation and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











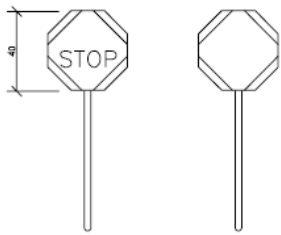
Table B Significance Impact Matrix

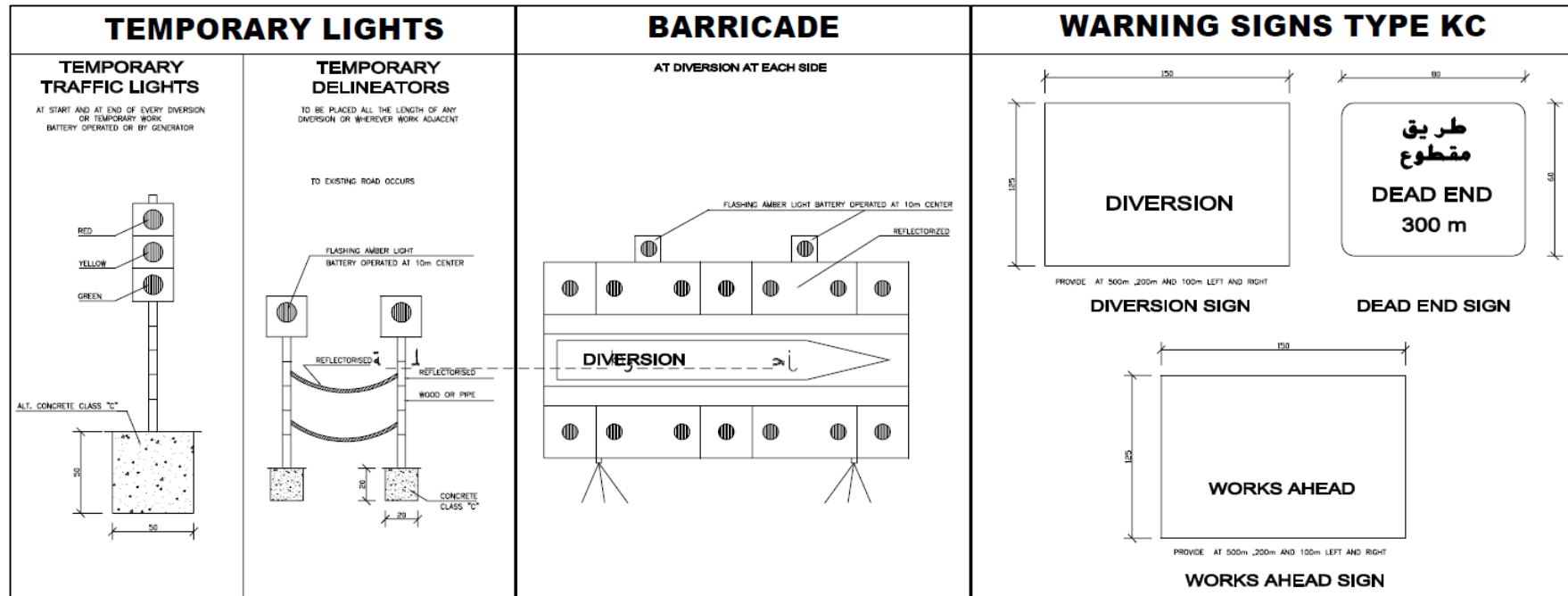
		Magnitude x Extent x Duration							
Likelihood x Frequency	1	2	3	4	5	6	7	8	9
	2	4	6	8	10	12	14	16	18
	3	6	9	12	15	18	21	24	27
	4	8	12	16	20	24	28	32	36
	5	10	15	20	25	30	35	40	45
	6	12	18	24	30	36	42	48	54

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

SIGNS TYPE K		TEMPORARY MARKING
 <p>PENNANT K1</p>	 <p>K2</p>	<p>THESE LINES ARE YELLOW AND REFLECTORISING. THEY CAN BE ERASED OR REMOVED WITHOUT ANY RESIDUAL TRACE.</p>  <p>FOR CONTINUOUS EDGE LINE AND FOR SEPARATING THE TRAFFIC IN OPPOSITE DIRECTIONS</p> <p>MR2 TEMPORARY</p>
 <p>K5a</p>	 <p>K5a</p>	 <p>K8</p>
 <p>K10a</p>	 <p>K16</p>	 <p>FOR SEPARATING THE TRAFFIC IN THE SAME DIRECTION</p> <p>TYPE T1</p>
		 <p>FOR SEPARATING THE TRAFFIC IN THE SAME DIRECTION</p> <p>TYPE T3</p>



WARNING SIGNS TYPE AK	BY FLAGMEN
<p style="text-align: center;">SIDE 0.70 m</p> <div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="text-align: center;">  <p>AK2</p> </div> <div style="text-align: center;">  <p>AK3</p> </div> <div style="text-align: center;">  <p>AK4</p> </div> <div style="text-align: center;">  <p>AK5</p> </div> <div style="text-align: center;">  <p>AK3+KM1</p> </div> <div style="text-align: center;">  <p>AK14</p> </div> <div style="text-align: center;">  <p>AK17</p> </div> <div style="text-align: center;">  <p>AK22</p> </div> <div style="text-align: center;">  <p>AK14+KM9+KM2 EXAMPLE</p> </div> <div style="text-align: center;">  <p>AK5+KM9</p> </div> </div>	<p style="text-align: center;">STANDARD SIGNS PADDLE</p> <div style="text-align: center;">  </div>



Annex 4: Code of Conduct

Contractor Code of Conduct:

1. All employees, associates, and representatives commit to treating women, children (under the age of 18), and men with respect, regardless of race; color; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status.
2. GBV constitutes acts of gross misconduct and is therefore grounds for sanction, which may include penalties and/or termination of employment. All forms of GBV are unacceptable, regardless of whether they take place on the worksite, the worksite surroundings, or off-site. In addition to the potential sanctions listed above, legal prosecution will be pursued, if appropriate, for any employees, associates, and representatives alleged to have committed GBV.
3. Demeaning, threatening, harassing, abusive, or sexually provocative language and behavior are prohibited among all company employees, associates, and representatives.
4. Sexual favors, making promises or favorable treatment dependent on sexual acts are prohibited.
5. Unless there is the full consent by all parties involved, sexual interactions between the company's employees (at any level) and members of the surrounding communities are prohibited. This includes relationships involving the withholding or promise of any kind of reward.
6. All employees, including volunteers and sub-contractors are expected to report suspected or actual GBV by a fellow worker, whether in the same company or not. Reports must be made in accordance with GBV allegation procedures.
7. All employees are required to attend an induction training course prior to commencing work on site to ensure they are familiar with the GBV Code of Conduct.
8. All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV Code of Conduct.
9. All employees will be required to sign an individual code of conduct confirming their agreement to support GBV activities.

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

Company Name:

Signed by:

Title:

Date:

Table L: Individual Code of Conduct Form

Individual Code of Conduct

- This individual Code of Conduct should be signed by all employees, from senior managers through the operational staff, and should also be required from any Contractors working with the company.
- I, _____, acknowledge that preventing gender-based violence (GBV) is important, and that preventing it is my responsibility. At [Company], GBV activities constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment. All forms of GBV are unacceptable, be it on the worksite, the worksite surroundings, or in the community. Prosecution of those who commit GBV may be pursued if appropriate.
- I agree that while working on the [Project], I will:
- Consent to a police background check.
- Treat women, children (persons under the age of 18), and men with respect regardless of race; color; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status.
- Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
- Not request or engage in sexual favors—for instance, making promises or favorable treatment dependent on sexual acts.
- Understand that unless there is the full consent by all parties involved, sexual interactions between the company's employees (at any level) and members of the surrounding communities are prohibited. This includes relationships involving the withholding or promise of monetary or non-monetary reward.
- Attend and actively partake in training courses related to HIV/AIDS and GBV as requested by my employer.
- Report through the GRM or to my manager any suspected or actual GBV by a fellow worker, whether in my company or not, or any breaches of this Code of Conduct.

Sanctions

[Company] has established a GRM for receiving, reviewing, and addressing allegations of GBV. If an employee has breached the Code of Conduct, the employer will take disciplinary action which could include:

- Informal warning
- Formal warning
- Additional training
- Loss of up to one week's salary
- Suspension of employment (without payment of salary), for a minimum period of one month up to a maximum of six months
- Termination of employment

In addition to the above, if warranted, [Company] will report the employee to the police as per local legal regulations.

I understand that it is my responsibility to use common sense and avoid actions or behaviors that could be construed as GBV or breach this Code of Conduct. I do hereby acknowledge that I have read the foregoing Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to GBV. I understand that any action inconsistent with this Code of Conduct or failure to act mandated by this Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Individual Name:

Signed by:

Title:

Date:

Annex 5: Public Consultation Notes, Presentation, Invitation Letters, and Attendance Sheets

Notes:

This ESMP was publicly consulted where a public participation meeting was arranged for Baalbek Caza. The public meeting was held at the Union of Baalbek Municipalities on Thursday August 24, 2023.

The main attendees of the meeting were namely the heads of concerned municipalities, citizens and relevant local NGOs

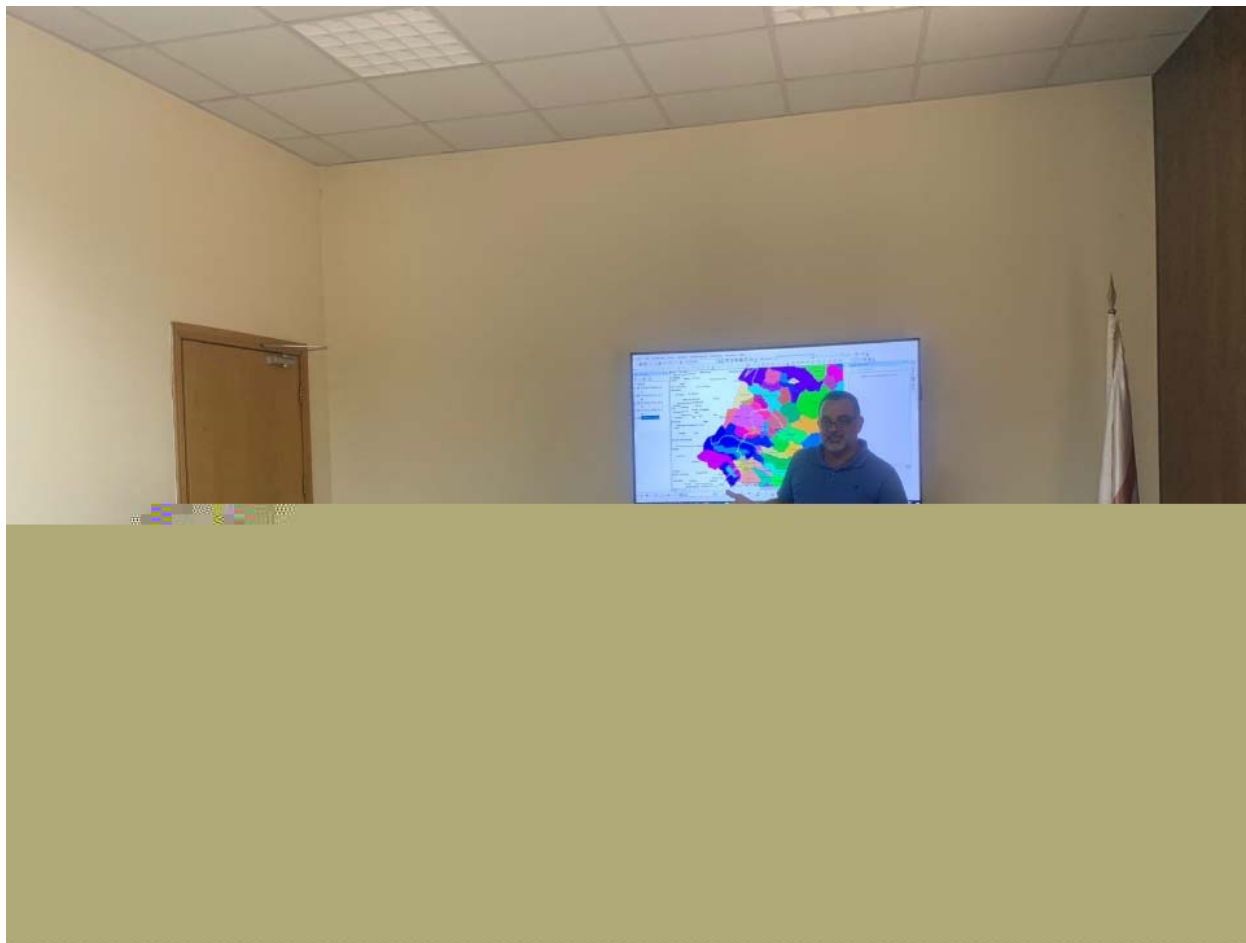
The presidents of the municipalities belonging to the municipalities' union of Baalbek insisted on the necessity that the project includes other villages that did not benefit from the project's first stage which constitutes the rehabilitation and maintenance of primary roads in several villages. For example, the representative of Majdaloun municipality stated that the main road there has huge export companies that have high economical potential that is inhibited by the current quality of the road. As it was mentioned, the asphalt is old and the width is too tight.

Additionally, there were requests that the secondary roads of the villages concerned in the project, be taken into consideration as they are also in need of maintenance. Finally, the NGOs that were present in the meeting expressed their wish to cooperate on this project.

It is to be noted that, concerning the municipalities union of each of Deir E Ahmar, Al Challal, South of Baalbek, Chlifa and West Baalbek, the public participation meetings are still in progress

Photos:

Public Consultation meeting for concerned roads



List of Participants

Profession	Phone Number
Head of Younin Municipality	03-863466
civil engineer	03-845215
Head of Iaat	03-313426
Representative of Majdaloun Union	03-960465
xxxx the Union Media	03-371027
Vice Head of Union of Baalback municipalities	78-276072
Vice head of Moqneh Municipality	03-220293
Head of Baalback Municipalities union	71-166449

Slides:

خطة الإدارة البيئية والاجتماعية لمشروع الطرق والعمالة

الإجتماع التشاوري لصيانة الطرق في قضاء بعلبك



المقدمة

- يقوم البنك الدولي بتمويل مشروع الطرق والعمالة، وهو مشروع سيمثل جزءاً من إعادة تأهيل وتطوير الطرق في لبنان والبالغة كلفته حوالي 510 مليون دولار أمريكي.
- يهدف هذا المشروع إلى تحسين وتأهيل وضع الطرق من خلال تحديد الأولويات وتحسين تقنيات إدارة شبكة الطرق.
- بحسب تقرير التنافسية العالمية التابع للمنتدى الاقتصادي العالمي 2018 فإن البيئة التحتية في لبنان هي ثالث عقبة رئيسية للنمو الاقتصادي.
- ومن بين المؤشرات الفرعية التسعة للبيئة التحتية التي يستخدمها المنتدى الاقتصادي العالمي، يحتل لبنان المرتبة الـ 121 بالنسبة لنوعية الطرق (المنتدى الاقتصادي العالمي، 2018).
- يعاني لبنان من حوادث السير بحيث معدلاتها هي الأعلى عالمياً مقارنةً بعدد السكان.

Road code	Villages: From to	Classification	Length (Km)	Width range (m)	Elevation range (m)
Baalbek Primary Road 01	TamnineEl Fachuqa	Primary	64,3	5-7	993-
	to Ainata(Arez-Baalbek Road)				2581
Baalbek Primary Road 02	Douris	Primary	15,1	5-7	1117-
	to Chlifa(Arez-Baalbek Road)				992
Baalbek Primary Road 03	Slouqi	Primary	17,4	5-7	2109-
	to HadathBaalbek				1104
Baalbek Primary Road 04	NabiRached	Primary	16,6	5-7	1118
	to Brital				1292
					1786



أهداف مشروع الطرق والعمالة

GEPI/NT/5.3.8.1

7

المكوّن الثالث بناء قدرات ودعم التنفيذ	المكوّن الثاني تحسين القدرة على الإستجابة لطوارئ	المكوّن الاول اعادة تأهيل الطرق وصيانتها
<ul style="list-style-type: none"> • بناء قدرات الهيئات اللبنانية في التخطيط وإدارة قطاع الطرق • المساهمة في تدريب وبناء قدرات المقاولين والعاملين على المشاريع حول تقنيات حديثة محصنة لبناء الطرق وصيانتها 	<ul style="list-style-type: none"> • تحسين قدرات وزارة الأشغال العامة والنقل على التعامل مع الطوارئ المتعلقة بالطرق (العواصف...) • مراجعة إجراءات الطوارئ الحالية التي تتبعها وزارة الأشغال العامة والنقل وقدرتها على التخطيط والإستعداد للحالات المناخية 	<ul style="list-style-type: none"> • إعادة تأهيل حوالي ٥٠٠ كم من الطرق الأساسية والثانوية والفرعية • تحسين ترابط خطوط النقل وخلق وظائف مباشرة وغير مباشرة للبنانيين والسوريين

GEPI/NT/5.3.8.1

8

أهداف الخطة الإدارية البيئية والاجتماعية

GEPI INT S.A.S.L.

9

أهداف خطة الإدارة البيئية والاجتماعية

الأهداف بعيدة الأمد

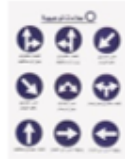
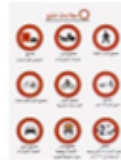
- تحسين الأوجه الاجتماعية للمشروع
- تقادي الضرر الذي لا يمكن إزالة أثره على البيئة
- حماية الصحة البشرية والسلامة العامة
- حماية الموارد البيئية
- تحقيق مبدأ الإستدامة

الأهداف قصيرة الأمد

- ضمان التوافق مع المعايير البيئية
- تحديد الآثار والإجراءات التخفيفية
- تحديد خطة إدارة المشروع وفق لمبدأ السلامة والاستدامة البيئية
- تحقيق الشفافية عبر إطلاع العامة على المشروع وشرح مكوناته

GEPI INT S.A.S.L.

10



الأشغال المقترحة

- إصلاح ورصف الطرق قشط وزيادة طبقات لتصحيح المنخفضات الموضعية
 - إصلاح الجدران الاستنادية العرساية التلغاف جدران الصخرية
 - إصلاح الأرصفة وحواجز الأمان
 - إصلاح شبكة تصريف مياه الأمطار
 - إصلاح شبكات الإنارة وكافة الأعمال الكهربائية والمدنية المتعلقة بها
 - تنفيذ علامات الطرق
 - الأعمال المساعدة الأخرى المرتبطة بما في ذلك إدارة حركة المرور أثناء الصيانة.
- مدة المشروع هي سنتين

GEPIANT S.A.S.L

34

وصف البيئة المحيطة

- نوعية التربة والمياه السطحية والجوفية
- تقييم الوضع الجيولوجي والهيدروجيولوجي
- تقييم الوضع البيولوجي
- وضع الضجيج
- الوضع الاجتماعي والاقتصادي للمنطقة
- مدى توفر البنى التحتية

GEPIANT S.A.S.L

35

فهرس خطة الإدارة البيئية والاجتماعية

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

GEPI/MT S.A.S.L.

11

أطر السياسات والأطر القانونية والإدارية

- القانون رقم ٤٤٤ / ٢٠٠٢ قانون حماية البيئة
- مرسوم رقم ٨٦٣٣ / ٢٠١٢ أصول تقييم الأثر البيئي الذي حدد المشاريع التي تستلزم حكماً إعداد دراسة تقييم أثر بيئي.
- قرار 52/1 (1996)
- قرار 8/1 (2001)
- السياسات التشغيلية للبنك الدولي (OP4.01, OP4.12)

GEPI/MT S.A.S.L.

12

الآثار البيئية المحتملة

- التأثير على نوعية الهواء ونوعية المياه
- زيادة في نسبة المخلفات الصلبة الناتجة عن عملية التأهيل
- زيادة في مستوى الضجيج
- تكثر الحركة التجارية للمؤسسات والمحال القائمة على جانبي الطريق
- تغير في حركة السير
- خطر على الصحة والسلامة المهنية والعمامة (في حال حصول اي حادث)

GEPIANT S.A.S.L.

15

التدابير التخفيفية

المخلفات الصلبة

ينبغي تعيين موظفين، مثل مدير موقع، ليكونوا مسؤولين عن الممارسات الجيدة في الموقع بما في ذلك التخلص الآمن من جميع النفايات

يجب تدريب الموظفين على إدارة النفايات

يجب إزالة المخلفات الصلبة من الموقع خلال 24 ساعة، ويجب التخلص منها في مكبات قانونية معتمدة.

نوعية المياه

يجب استخدام حواجز لمنع وصول الترسبات الرملية إلى قنوات المياه حيث الطريق يقع في القرب من نهر سروت

يجب تغطية مواد البناء لتجنب غسلها إلى المسطحات المائية

ينبغي تطبيق ممارسات ترشيد المياه من قبل خلال البناء

نوعية الهواء

استخدام آلات ذات انبعاثات منخفضة في أعمال التأهيل

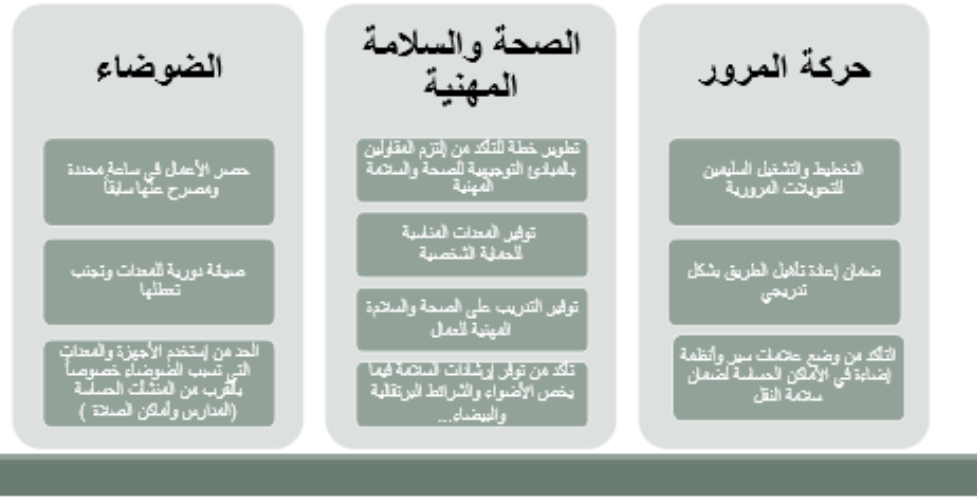
توجيه مصادر الانبعاثات بعيداً عن المساكن المحيطة

رش الطرق بانتظام بالماء لمكافحة الغبار

تغطية مركبات نقل المواد الأولية والمخلفات من وإلى موقع المشروع

تحديد سرعة المشاة والمركبات

التدابير التخفيفية



خطة الإدارة البيئية والاجتماعية

هدف الخطة الادارة البيئية: مراقبة المشروع والتأكد من مطابقته مع جميع المعايير البيئية. بعد دراسة الآثار المحتملة للمشروع، تقوم الدراسة باقتراح اساليب تخفيفية لهذه الآثار وميل لمراقبتها.

خطة الادارة البيئية تتضمن:

- مراقبة نوعية المياه
- مراقبة نوعية التربة
- مراقبة نوعية الهواء
- مراقبة نوعية التنوع البيولوجي
- مراقبة الصحة والسلامة العامة
- خطة طوارئ للتصرف السليم في حال حدوث اي حادث مفاجئ .

شكراً لحضوركم



Public Consultation Invitation Letters



جانب المسادة اتحاد بلديات بعلبك المحترمين الموضوع: دعوة لحضور اجتماع مشاركة عامة حول مشروع "الطرق والعمالة"

تحية طيبة وبعد،

حيث كانت الحكومة اللبنانية قد حصلت على تمويل من البنك الدولي لمشروع الطرق والتوظيف (REP). يقوم مجلس الإنماء والإعمار (CDR) بصفتها الجهة المنفذة بتحديد أنشطة إعادة الصيانة المحصورة ضمن محاذات الطرق الحالية مع عدم وجود توسيع للطرق، وعدم إعادة التوطين القسري، وعدم استملاك الأراضي. في هذا السياق، منح مجلس الإنماء والإعمار العقد رقم 20379 لشركة الخبراء العرب في الهندسة والإدارة (تيم) TEAM International، المشار إليها فيما يلي باسم الاستشاري، لإعداد التقييم والتصميم وخطط الإدارة البيئية والاجتماعية للطرق في مناطق البترون وبشري والكورة وطرابلس وبعبك والهرمل.

إن أنشطة الصيانة التي يتعين إجراؤها أثناء المشروع تختلف بين طريق وآخر، اعتمادًا على تصنيف الطريق من حيث حالة الرصيف والكثفين والصرف والانهيار الأرضي المحتمل و/أو تآكل التربة والجدران الاستنادية وممرات المشاة وإضافة و/أو إعادة تأهيل إدارة الشوارع. سيتم تنفيذ أنشطة الصيانة الروتينية لمدة عامين ضمن قضاء بعلبك، للطرق الرئيسية كاولوية والطرق الثانوية حيث تتوفر الأموال.

ولما كانت تكلفت شركة TEAM International من قبل مجلس الإنماء والإعمار للقيام بالدراسات الهندسية والبيئية المتعلقة بالمشروع والتي بدورها كلفت شركة جيوفلنت ش.م.م. للاستشارات البيئية بإعداد خطة إدارة بيئية واجتماعية للمشروع المذكور؛

وحيث أنه برزت الضرورة لعقد اجتماعات تشاورية مع الجهات المعنية والعامة بشؤون البيئة والأمر الاجتماعي ذات الصلة بمشاريع الطرق والإستماع إلى آرائهم المتعلقة بالمشروع؛

وبما أن قضاء بعلبك يتضمن طرقات من مجموع الطرقات الملحوظة للصيانة في هذا المشروع؛

لذلك



Geoflint s.a.r.l.
Cell : 00961-3-219 059
Phone: 00961-5-954 662/3/4
Fax: Ext. 108
GF Bldc - center Mar Roukoz- Hameeth
P.O. Box: 45 - 165
BEIRUT - LEBANON
website: www.geoflint.com

جيوفلنت ش.م.م.
هاتف: 00961-3-219 059
هاتف: 00961-5-954 662/3/4
فاكس: 108
الطابق الأرضي - ماروكز سنتر - الحامية
صندوق بريد: 45 - 165
بيروت - لبنان
شهادة تسجيل شركة رقم: 2392264

ندعوكم لحضور إجتماع مشاركة للعامة في تمام الساعة الواحدة من بعد الظهر من يوم الخميس الواقع في 24/08/2023 في مبنى اتحاد بلديات بعلبك، ونتمنى على المواطنين الكرام، إبداء الملاحظات الخفيفة، في حال وجودها، حول المشروع المذكور، وإبلاغها إلى شركة جيوفلنت ش.م.م. على الأرقام التالية:
00961-5-954 662/3/4 أو إبلاغها لدى اتحاد بلديات بعلبك.

وتفضلوا بقبول فائق الاحترام

مدير شركة جيوفلنت ش.م.م.
خليل زين
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