THE WORLD BANK

سلطة الطاقة والموارد الطبيعية

Palestinian Energy & Natural Resources Authority

Environmental and Social Management Plan

Electricity Sector Performance Improvement Project (ESPIP & AF)

ESMP Report

Households and Schools

Prepared by:

Dr. Fahid Rabah

April 02, 2021

Table of Contents

List of Tables

List of Figures

Abbreviations and Acronyms

AMI	Advanced Metering Infrastructure
BP	Bank Procedure
CO2	Carbon Dioxide
DB	Decibels
DISCO	Electricity Distribution Companies
EA	Environmental Assessment
EHS	Environmental Health And Safety
EQA	Environment Quality Authority
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESPIP	Electricity Sector Performance Improvement Project
GEDCo	Gaza Electricity Distribution Company
GBV	Gender-based Violence
GPP	Gaza Power Plant
GRM	Grievance Redress Mechanism
HH	Household
HWMP	Hazardous Waste Management Plan
IEE	Initial Environmental Evaluation
ISO	International Organization For Standardization
kWh	Kilowatt Hour
kWp	Kilowatt Peak
MIS	Management Information Systems
MoEHE	Ministry of Education and Higher Education
MoWA	Ministry of Women Affairs
NO	Nitrogen Oxide
OP	Operational Policy
OSHA	Occupational Safety and Health Administration
PAP	Project Affected People
PCBS	Palestinian Central Bureau Of Statistics
PEAP	Palestinian Environmental Assessment Policy
PEL	Palestinian Environmental Law
PENRA	Palestinian Energy and Natural Resources Authority
PERC	Palestinian Electricity Regulatory Council
PETL	Palestinian Electricity Transmission Company
PM	Particulate Matter
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSI	Palestinian Standards Institution
PV	Photovoltaic
RPP	Revenue Protection Program
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SME	Small And Medium Enterprises
TA	Technical Assistance
WB	World Bank Group
WHO	World Health Organization

Executive Summary

For the past decade, the Gaza Strip has been affected by chronic electricity shortages that has undermined the provision of basic services in different sectors and at all levels. The Electricity Sector Performance Improvement Project (ESPIP) is designed to improve the efficiency of the Palestinian electricity sector and energy security in Palestine by applying a set of measures along the energy supply chain. The project comprises four main components as follows:

- Component 1: Strengthening the Capacity of Palestinian Electricity Sector Institutions;
- Component 2: Improving the Operational Performance of Palestinian Electricity Distribution Companies (DISCOs);
- Component 3: Improving Energy Security in Gaza with Solar Energy (revolving fund component for HHs and SMEs & Grant component for Health sector);
- Component 4: Technical Assistance, Capacity Building and Project Management.

Under this project, the Gaza Solar Revolving Fund is financed as part of component 3. This Fund is aiming to install rooftop solar energy in Gaza for residential consumers and businesses. The model allows consumers to apply to the revolving fund for solar PV systems, with the cost repaid in monthly installments into the revolving fund. All payments will be made towards a revolving fund, which will be used to install more solar systems on additional rooftops. This Fund covers the installation of PV systems for number of households. The beneficiaries will pay back the capital costs in monthly installments. All payments will be made towards a revolving fund, which will be used to install more solar systems on additional rooftops.

Furthermore, for this package under Component 3, a grant component is allocated for the installation of PV systems for a number of public schools. The World Bank will finance the supply and Installation of PV solar systems under this component. Therefore, the project is guided by the World Bank safeguard policies along with the Palestinian laws and regulations in the energy and environment sectors.

Under this assignment, the Consultant has prepared a full site-specific ESMP for 7 public schools and 5 households that are distributed along different locations in the Gaza Strip. The proposed systems to be installed for these facilities are rooftop. The main components of these installations include Photovoltaic modules, hybrid inverter, lead acid batteries, cables, protections and other accessories, and steel structure.

Policy and legal framework

The project is guided by the World Bank safeguard policies along with the local laws and regulations set by the Palestinian Authority. Therefore, the applicable policies, laws and guidelines include:

- World Bank OP/BP 4.01 on Environmental Assessment: According to this policy, the project is classified as (category B) given that the potential adverse impacts are neither unprecedented nor are they as critical as those of (category A). I.e. the potential negative impacts on human populations and environment are site specific; and the mitigation measures are easily designed and implemented. For such projects, the policy requires an ESMP to be prepared.

- Palestinian Environmental Assessment Policy: In accordance with this policy, an Initial Environmental Evaluation (IEE) is required for projects where significant environmental impacts are uncertain, or where compliance with environmental regulations must be ensured. The IEE study should include the predicted impacts and benefits of the project, and the proposed mitigation and environmental monitoring and management measures.
- The Palestinian Environmental Law (PEL) No. 7 of 1999
- WHO Ambient Air Quality Guidelines.
- WHO Noise Level Guidelines
- Palestinian Ambient Air Quality Standards
- Palestinian Noise Level Guidelines
- World Bank Environmental, Health and Safety General Guidelines
- MoH and WHO Guidelines regarding COVID-19 disease

Baseline Conditions

Location: Taking into consideration the type of the proposed systems for the different facilities (rooftop), the on-site objects found in the PV installations' sites in these sites are mainly solar water heaters, water tanks and existing PV solar systems. As the sub-projects sites are commonly located in residential areas, the surroundings of the proposed sites for PV installations are mainly residential buildings, public buildings and small scale agricultural lands.

Energy Supply: The existing power supply options in the 12 sub-projects sites include mainly an external supply from the Gaza Electricity Distribution Corporation (GEDCo) grid. Some of the target schools have old and ineffective emergency diesel generators for on-site generation to cover the load of the main devices in the school during power cuts. Moreover, some of the target households use an external supply from private diesel generators, where the household pays about 4 NIS per one kw it consumes from these generators. Most of the households also use UPS batteries to store energy to be used during power cuts to cover the operation of lights and/or some other devices that consume little power.

Public Consultation

In order to ensure the proper engagement of the identified Project Affected Persons (PAPs) and other relevant stakeholders, and given the current conditions due to the curfew imposed as a result of the outbreak of Covid-19 in the Gaza Strip, the consultation activities during the course of the study were limited to individual meetings.

The 12 beneficiaries of the project were approached at their sites through individual meetings that took place between March 18 and March 25, taking in consideration World Bank's Covid-19 protocols for public consultations and stakeholder engagement. During these meetings, the sub-project components, locations and baseline conditions of the proposed sites were reviewed. The environmental and social requirements were also addressed, where the proposed ESMP and some of the anticipated environmental and social risks and impacts were discussed. Moreover, neighbors of the sites were also approached through interviews. The meetings have also discussed the existing GRM (Leaflets showing GRM channels were provided to them) that is meant to address the complaints, opinions and suggestions related

to the project. The general opinions and concerns from the interviewed personnel were incorporated and addressed within this report.

Grievance Redress Mechanism

A grievance redress mechanism has been established by PENRA for this project, and it is being used in coordination with GEDCo. The existing GRM follows clear procedures for receiving and handling complaints, which take place upon six stages, namely:

- the pre-complaint stage
- receiving the complaint
- studying and following-up the complaint
- closing the complaint and preparing reports
- unsettled complaints
- appeals process

For each of these stages, mechanisms to deal with different cases are illustrated, and a clear time frame is provided. The GRM has already been activated that people who have any project-related complaints can submit their complaints through different channels including personal attendance of the complainant at GEDCo headquarter or at PENRA office in Gaza, using the complains box placed in PENRA offices, filling electronic complaints form that are available at GEDCO & PENRA websites, (http://eservices.gedco.ps/Complaint/), ((http://www.penra.pna.ps/complaintForm) respectively, and using phone call where the GRM officer at PENRA receives and registers the complaints.

The GRM procedures has also been updated to manage complaints during COVID-19 pandemic, where people who might have any project-related complaints are advised, , to submit their complaints electronically or via telephone rather than submit their complaint in person. The update has also covered the provision of additional codes and procedure to manage anonymous and GBV related grievances.

Potential Environmental and Social Impacts

While there are substantial anticipated overall improvements for communities and the environment from the proposed sub-projects, some negative impacts have been identified. These have been classified into impacts during construction activities and impacts during the operational and maintenance phases.

The affected environmental and social parameters were identified based on the Environmental and Social Framework (ESMF) and the generic ESMP prepared for the project, the public consultations, and the experience of the consultant with similar projects. Then, the significance of the identified impacts was assessed taking into consideration different factors including nature, magnitude, geographical extent, timing, duration and reversibility of the impact.

Responding to the impacts identification and assessment, detailed site-specific mitigation measures were identified and evaluated in order to avoid, reduce or remedy the impacts associated with the project implementation during different phases.

The main negative impacts during the construction phase are those related to public and occupational health and safety. Workers are particularly susceptible to impacts from working

from height, given that the PV installations in the sub-projects sites will be rooftop installations. On the other hand, given that the construction activities will take place in residential areas, public are also susceptible to safety risks during construction activities. Moreover, given the timeframe of the construction activities, which are proposed to take place during the current COVID-19 pandemic, special concerns regarding the risk of infection were also addressed. However, all impacts during construction phase, have been assessed to be short-term impacts that can be minimized, if appropriate mitigation measures are applied, as required by and based on the recommendations in this report.

During the operation and maintenance phase, overall positive impacts with high significance are expected concerning energy and air and noise quality. The project will increase energy independence and security in case of conflict, longer hours of available power supply, and cleaner and cheaper alternative to stand-by generators. The proposed systems are designed with sufficient capacities that will cover the basic energy needs of the target schools and households.

On the other hand, the end-of-life disposal of storage batteries and the solar panels when they fail to perform efficiently could be a source of risk to the environment and public and occupational health. However, this risk will be minimized through the proposed mitigation measures and Hazardous Waste Management Plan (HWMP) that should be followed through appropriate coordination with EQA to ensure safe storage, collection, transportation, recycling/reuse and disposal of these materials.

Environmental and Social Management Plan

The ESMP is designed to monitor the effectiveness of the identified mitigation actions, during and after construction. The ESMP provided in this report is generated based on the ESMF and the generic ESMP prepared for this project, and adjusted/updated, where required, based on the findings of the data collection and impact assessment processes for this assignment.

The ESMP provides the required mitigation measures, institutional responsibilities and recommended monitoring activities and their frequency. In general, the responsible party for implementation of mitigation measures during construction is the construction contractor (Contractor) while the Supervision Engineers from PENRA as well as EQA are responsible for monitoring. On the other hand, the main responsible party for the implementation of mitigation measures during system operations will be the O&M departments at each facility, while PENRA will be the main monitoring party, along with other relevant institutions, such as EQA for PV panels and storage batteries disposal. Detailed ESMP for different project phases is provided in Chapter 7 of this report.

1. Introduction

1.1. Background

For the past decade, the Gaza Strip has been affected by chronic electricity shortages that has undermined the provision of different services at all levels. Electricity in the Gaza Strip depends on three main sources namely, electricity imports from Israel, electricity production at Gaza Power Plant (GPP), and electricity imports from Egypt. Combined, these three sources cover less than 40 % of the daily electricity demand in the Gaza Strip, causing rolling power cuts from 12 to 18 hours daily (UN, 2017).

The chronic electricity deficit restricts students' ability to concentrate and learn at schools. As a result, the Ministry of Education and Higher Education (MoEHE) in the Gaza Strip have to rely on backup diesel generators to provide schools with energy, if possible, during grid electricity outage. According to the MoEHE, $130,000 is required every month for fuel to run generators for 253,263 children to learn in a proper school environment, to use science and IT laboratories, and to attend vocational lessons (OCHA, 2018). Similarly, many households in the Gaza Strip have to rely on backup diesel generators to sustain critical services during grid electricity outage, which is also an unreliable option considering obstacles and restrictions regarding fuel availability.

The Electricity Sector Performance Improvement Project (ESPIP), developed in cooperation with the World Bank, is designed to improve the efficiency of the Palestinian electricity sector and energy security in Palestine by applying a set of measures along the energy supply chain. The project comprises four main components that focus on capacity building, operational performance improvement, and technical assistance activities, as well as the implementation of PV solar systems for residential customers, small and medium-sized enterprises (SMEs), critical health facilities, and public schools.

Under this project, the Gaza Solar Revolving Fund is financed as part of component 3. This Fund is aiming to install rooftop solar energy in Gaza for residential consumers and businesses. The model allows consumers to apply to the revolving fund for solar PV systems, with the cost repaid in monthly installments into the revolving fund. All payments will be made towards a revolving fund, which will be used to install more solar systems on additional rooftops. This Fund covers the installation of PV systems for number of households (5 HHs under this package). The beneficiaries will pay back the capital costs in monthly installments. All payments will be made towards a revolving fund, which will be used to install more solar systems on additional rooftops.

Furthermore, for this package under Component 3, a grant component is allocated for the installation of PV systems for 7 public schools (19 kWp for each school). The World Bank will finance the supply and Installation of PV solar systems under this component. Therefore, the project is guided by the World Bank safeguard policies along with the Palestinian laws and regulations in the energy and environment sectors.

1.2. ESMP Scope and Objectives

The Palestinian Energy and Natural Resources Authority (PENRA) has prepared an Environmental and Social Framework (ESMF) and a generic ESMP for the project, while Dr. Fahid Rabah - Environmental and Social Consultant has been assigned to provide a detailed and site-specific ESMP for each sub-project. The main objective of the site-specific ESMP is to define the potential impacts of each sub-project and document the mitigation measures to prevent or minimize predicted negative impacts during project implementation and operation. Specifically, this ESMP is designed to ensure the following:

- Identify potential impacts that may occur during implementation stage of the various project activities;
- Develop detailed specific mitigation measures that will need to be achieved during and after sub-project implementation;
- Specify responsibilities and institutional arrangement that will be put in place to ensure that the mitigation measures are implemented;
- Integrating environment fully into the various activities of the proposed project and ensuring inclusion of environmental requirements into tender documents, continuing management and evaluation of the environmental performance of the project;
- Providing detailed design criteria for specific mitigation measures to be implemented, if required; and
- Provide implementation and monitoring schedule.

This ESMP covers 12 sub-projects that will be implemented with different capacities for schools and households in different locations in the Gaza Strip.

2. Project Description

2.1. Project overview

The key objective of ESPIP is to improve the efficiency of the Palestinian electricity sector and energy security in Palestine through a set of measures along the energy supply chain. In order to achieve this objective, the project comprises four main components as follows:

- **Component 1: Strengthening the Capacity of Palestinian Electricity Sector Institutions**. This component focuses on the sustainability and performance of the Palestinian Electricity Transmission Company Ltd (PETL) and the Palestinian Electricity Regulatory Council (PERC).

- **Component 2: Improving the Operational Performance of Palestinian Electricity Distribution Companies (DISCOs).** This component focuses on the sustained improvement of operational performance of the five DISCOs in the West Bank. It includes a "Revenue Protection Program" (RPP) with improved metering and billing systems. The RPP will reduce commercial losses by installing smart meters in high-end costumers and advanced metering infrastructure (AMI). In addition, the component will finance new or upgraded Management Information Systems (MIS) in selected DISCOs to further improve their commercial operations.

- **Component 3: Improving Energy Security in Gaza with Solar Energy (revolving fund component for HHs and SMEs & Grant component for Health & Education sector).** This component aims to reduce the barrier to entry for all income levels, including the poor, thereby creating a model that can be easily replicated and rapidly scaled up. Due to limited funding, the pilot funded under this component will not significantly change Gaza's energy crisis on its own. However, in the long terms, the benefits of scaling up rooftop solar will include: i) increased energy security in case of conflict, ii) longer hours of available power supply, and iii) cleaner and cheaper alternative to stand-by generators.

- **Component 4: Technical Assistance, Capacity Building and Project Management.** This component will be used to strengthen the capacity of PENRA and support staffing the Project Management Unit (PMU) for two years. The PMU is located at PENRA's offices in Ramallah. The PMU staff will be integrated in PENRA's payroll after two years to ensure the Project's sustainability.

2.2. Sub-projects Components

The systems are rooftop and will be installed on the available space of the facilities' roofs using fixed structures with optimum orientation at azimuth 0° – i.e. modules facing true south – and using the optimum tilt angle of 30°.

The main components of the proposed systems will be provided in the form of a kit that has a specific capacity, in general the kit includes: Photovoltaic modules (PV Generator), hybrid inverter, lead acid batteries, cables, protections and other accessories, and steel structure. The general layout and specifications of the proposed systems, including specifications of PV

generator, wiring diagrams, and specifications of equipment cabinet and battery are provided in Annex 1. The PV systems that are intended to be installed for schools will have a size of 19 kWp, while those to be installed for households will have a size of 2.5 kWp.

The PV modules for each site will be installed in single or multiple sheds, with different dimensions, taking into consideration an inter-row spacing of at least 4 meters between the sheds that are placed in two different rows.

3. Applicable Environmental, Health, and Social Policies and Laws

Environmental legislation and regulations are vital tools to protect public health and the environment and give consideration to sustainable development. The project is guided by the World Bank safeguard policies along with the local laws and regulations set by the Palestinian Authority. Therefore, this chapter of the report discusses the related World Bank safeguard policies as well as the existing Palestinian legal and policy framework for the environmental sector.

3.1. World Bank OP/BP 4.01 on Environmental Assessment

Under the World Bank's operational policies, there are ten environmental and social policies referred to as the Bank's "safeguard policies". The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process.

The screening of applicable World Bank social and environmental safeguards policies indicated that, among these policies, OP/BP 4.01 on Environmental Assessment is triggered by this project. The overall objective of the OP/BP 4.01 is to help ensuring the environmental and social soundness and sustainability of investment projects. As per this policy, environmental assessment is required by the World Bank for projects proposed for WB financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making.

According to this policy, the WB undertakes environmental screening of each proposed project to determine the appropriate extent and type of EA. The WB classifies the proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. Based on the screening of this project, the project is classified as category B given that the potential adverse impacts are neither unprecedented nor are they as critical as those of Category A. I.e. the potential negative impacts on human populations and environment are site specific; and the mitigation measures are easily designed and implemented. For such projects, the policy requires an ESMP to be prepared.

3.2. Palestinian Environmental Assessment Policy

The Palestinian Environmental Assessment Policy (PEAP) was approved by decree No: 27-23/4/2000. The PEAP supports the sustainable economic and social development of the Palestinian people. Specifically, the PEAP promulgates the following:

- Ensure an adequate quality of life in all aspects, and ensure that the basic needs and social, cultural, and historical values of the people are not negatively impacted as a result of development activities.

- Preserve the capacity of the natural environment.
- Conserve biodiversity and landscape, and promote the sustainable use of natural resources.
- Avoid irreversible environmental damage, and minimize reversible environmental damage from development activities.

Under the PEAP, proponents of public and private projects are required to submit an Application for Environmental Approval that informs the EQA and relevant approving authorities of the intended project activities. Subsequently, a determination is made whether an Initial Environmental Evaluation (IEE) or a detailed EA is required. If neither an IEE nor EA report is required, the EQA, in coordination with the EA Committee, will determine if an Environmental Approval will be granted and, if so, under what conditions. An IEE is required for projects where significant environmental impacts are uncertain, or where compliance with environmental regulations must be ensured

In accordance with this policy, an IEE study should include the predicted impacts and benefits of the project, and the proposed mitigation and environmental monitoring and management measures.

3.3. Palestinian Environmental Law

The Palestinian Environmental Law (PEL) No. 7 of 1999 was developed by the Environment Quality Authority (EQA), to protect environmental resources, including land environment; air environment; water resources and aquatic environment; and natural, archaeological and historical heritage. According to the PEL, the protection of these resources shall be addressed in all social and economic development plans in view of sustainable development and protection of the rights of future generations.

The core issues of concern in the PEL are the protection of public health and social welfare, as well as the conservation of ecologically sensitive areas, biodiversity and rehabilitation of environmentally damaged areas. The PEL also sets penalties for violating any article presented under this law. The main objectives of the PEL include the following:

- Protecting the environment from pollution.
- Protecting public health and social welfare.
- Incorporating environmental resources protection in all social and economic development plans and promoting sustainable development to protect the rights of future generations.
- Conserving ecologically sensitive areas, protecting biodiversity, and rehabilitating environmentally damaged areas.
- Establishing inter-ministerial cooperation.
- Promoting environmental information collection and publication.
- Promoting public awareness, education and training.

Article 8 of this law reads, "*The competent authorities, consistent with their respective specialization, shall encourage undertaking appropriate measures to reduce the generations*

of solid waste or any other hazardous waste to the lowest level possible, and to the best extent possible, shall encourage solid waste treatment, recycling or processing".

Articles 12 and 13 of the PEL provide for the disposal of hazardous materials, such as solar panels and storage batteries, only under the umbrella of the Environmental Quality Authority (EQA) approval, in coordination with the specialized agencies. Furthermore, a special license is required from EQA to import hazardous materials, such as could be contained in solar panels and batteries. Article 45 empowers the EQA to set standards for environmental impact assessment studies and to prepare the relevant rules and procedures for such studies.

In accordance to Article 49, the PEL further requires EQA to cooperate with the competent authorities to follow up on the implementation of decisions that are issued concerning the environmental impact. EQA is also required, according to Article 50, to monitor compliance with approved specifications, standards and instructions for the protection of environment and vital resources. The law further empowers EQA inspectors and other appointed inspectors to record the environmental violations and crimes that may take place and violate this law, as per Article 51. EQA inspectors shall also have, in cooperation with the competent departments and authorities, right of entry into the installations for the purpose of: inspecting them, taking samples, carrying out measurements, and ascertaining the application of the standards and conditions of the environment protection and prevention of pollution, according to Article 52.

The EQA is also empowered, as per Article 57, to stop, for a period not exceeding two weeks, any project works that could constitute a serious hazard to the environment. The stoppage can only be extended by a judicial order from the competent court.

3.4. WHO Ambient Air Guidelines

The WHO Air Quality Guidelines (2005) are recommended by the WB Environmental, Health and Safety Guidelines to be applied in the absence of national legislated standards, in order to prevent or minimize significant to ambient air, by ensuring that emissions do not result in pollutant concentrations that reach or exceed these guidelines and standards. Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines. Table 3-1 sets a comparison between the WHO and Palestinian ambient air quality standards.

Table 3-1: WHO and Palestinian Ambient Air Quality Guidelines

Parameter	Averaging Period	WHO Guideline value* ($\mu g/m^3$)	Palestinian Guideline value ($\mu g/m^3$)
PM_{10}	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)	150
	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)	70
NO_2	1-hour	200 (guideline)	400
	24-hour	--	200
	1-year	40 (guideline)	100

Parameter	Averaging Period	WHO Guideline value* ($\mu g/m^3$)	Palestinian Guideline value ($\mu g/m^3$)
O3	1-hour	--	200
	8-hour	160 (Interim target-1) 100 (guideline)	120
SO_2	1-hour	--	350
	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)	250
	1-year	--	60
	10-minute	500 (guideline)	--

* PM 24-hour value is the 99th percentile.

3.5. Palestinian Ambient Air Quality Standards

The Palestinian Ambient Air Quality Standards (PS 801- 2010) were developed by the Palestinian Standards Institution (PSI) through the Environment Committee. The result is health based standards and objectives for a number of pollutants in air, including particulate matter, nitrogen oxides, ozone and sulfur oxides as shown in Table 3-1 for the comparison between the Palestinian and the WHO ambient air standards.

3.6. WHO Noise Level Guidelines

Guidelines for Community Noise, World Health Organization (WHO), 1999, provided guidelines values for noise levels measured out of doors. These levels, presented in Table 3-2, should not be exceeded by any noise source.

Table 3-2: WHO Outdoor Noise Level Guidelines

Receptor	One Hour LAeq (dBA)	
	Daytime (07 am – 10 pm)	Nighttime (07 am – 10 pm)
Residential, institutional, educational	55	45
Industrial, Commercial	70	70

3.7. Palestinian Noise Level Guidelines

The Palestinian Standards Institution have established the Outdoor Noise Standards (PS 840-2005), through the Environment Committee, to Provide information for the protection of public health against the outdoor noise level. These guidelines are shown in Table 3-3. The Palestinian and the WHO guidelines have almost the same levels, with the Palestinian guidelines having more detailed types of receptors.

Table 3-3: Palestinian Outdoor Noise Level Guidelines

Receptor	One Hour LAeq (dBA)	
	Daytime (07 am – 08 pm)	Nighttime (07 am – 08 pm)
Rural residential areas, hospitals, schools	40	30
Residential	50	40
Residential with some commercial activities, or along main roads	55	45
Commercial	65	60
Industrial	75	65

3.8. Guidelines regarding COVID-19

At the national level, the Palestinian Ministry of Health has put up a set of guidelines to deal with Covid-19 in order to prevent and reduce the risk of the virus transmission after resuming activities during the pandemic. These guidelines provide instructions regarding work places, public gatherings, commerce restrictions, education system, transport, sport activities, religious activities, markets and public settings restrictions and guidance for the health care facilities and providers (The guidance is available on the following link: https://drive.google.com/file/d/10FD30-5MsF1gfuoue9OxPaHFkYPCOUUJ/view?usp=sharing

According to these guidelines, public gatherings and meetings should be limited, and strict restrictions should be followed where meetings or any other means of public gatherings are required. Smaller meetings, where the number of participants does not exceed 50% of the meeting hall capacity, are permitted, while online meetings are still preferable.

On the other hand, WHO has issued a technical guidance that tackle different aspects in dealing with COVID-19. All these documents are available on the WHO website through the following link: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance.

3.9. Regulations regarding Child Labor and Forced Labor

3.9.1. The Palestinian Labor Law (2000)

The major legislation in Palestine that governs the rights of the labors and the terms and conditions of the employment is the Palestinian Labor Law no (7) of (2000).

The Labor Law no (7) provides the basic conditions of employment with a view of improving the status of employees in Palestine. The Palestinian Labor Law explains the working hours, wages, leaves, the reward of work end, work contracts etc. Below is the overview of some key aspects of Palestinian Labor Law (No. 07 of 2000) that are relevant to child and forced labor.

- ***Working age***

As the construction activities will involve hazardous work, persons under the age of 15 will not be employed by the Project (This is according to the Palestinian Labor Law No. 7 of 2000, article No. 93).

- ***Working hours***

The maximum number of hours per day that contracted workers must perform on the project is 8 hours; and the allowed work week of 48 hours. For direct workers, the number of hours per day is 7 hours; and the work week of 35 hours.

- ***Labor disputes***

Palestinian Labor Law includes provision for workers exemption from legal fees arising from work-related disputes and allows to unionize. A bipartite committee will settle any disputes that may arise from the implementation of agreement. The court has jurisdiction over labor related disputes.

3.9.2. IFC Policy Statement on Forced Labor and Harmful Child Labor (1998)

Under this policy, IFC will not support projects that use Forced or Harmful Child Labor as defined below. Projects should comply with the national laws of the host countries, including those that protect core labor standards and related treaties ratified by the host countries.

Forced Labor, based on ILO definition, consists of all work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty.

Harmful Child Labor, based on the UN Convention on the Rights of the Child, consists of the employment of children that is economically exploitative, or is likely to be hazardous to, or interfere with, the child's education, or to be harmful to the child's health, or physical, mental, spiritual, moral, or social development.

3.9.3. ILO Convention 182 (1999)

The International Labour Organization Convention 182 calls for the immediate elimination of the worst forms of child labor and defines a child as anyone under 18. Worst forms include: (i) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labour, including forced or compulsory recruitment of children for use in armed conflict; (ii) the use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances; (iii) the use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties; (iv) work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children.

3.10. Regulations and Guidelines regarding Occupational Health and Safety

3.10.1. The Palestinian Labor Law (2000)

According to Articles 90 through 92 of the Palestinian Labor Law No. 07 of 2000, the Council of Ministers shall issue the regulations governing the occupational safety and health and work environment. Such regulations shall in particular provide for personal protection and prevention methods for workers from the work hazards and occupational diseases, the necessary health conditions that should be present at the workplaces, first medical aid means provided for workers at the installation, and the periodical medical examination of workers.

According to the provisions of this Law and the regulations issued according to it, the installation shall issue the instructions on occupational safety and health in addition to the list of penalties related to such instructions. Both the instructions and the list shall be approved by the Ministry of Labor. Such instructions shall be posted on visible locations at the installation. And no installation shall make the worker bear any expenditures or deductions from his/her wage in return for the provision of the conditions related to occupational safety and health.

Following the Labor Law, several resolutions and ministerial instructions were issued detailing health conditions and standards related to occupational safety at different workplaces. These include:

The ministerial decrees No. 15, 17, and 21 of 2003 concerning health conditions and standards at workplaces, medical assistance procedures at the workplace, and safety standards at companies.

- The Decision of the Council of Ministers No. (49) of 2004 concerning the preventive list of work hazards and career diseases and work accidents.

- Instructions by the Minister of Labor no. (1) of 2005 concerning the precautions to protect workers in construction sites.
- Instructions by the Minister of Labor no. 2-6 of 2005, defining the range of chemical exposure limits and standards, exposure to ionizing radiation, noise, and safe levels of brightness of light and temperature at the workplaces.

3.10.2. IFC Environmental, Health and Safety General Guidelines

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents which are applied when one or more members of the World Bank Group are involved in a project. These Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, which provide guidance to users on environmental, community health and safety and occupational health and safety issues in specific industry sectors. These guidelines were used during the identification of mitigation measures and monitoring activities.

These guidelines include a specific section on occupational health and safety to ensure that employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. Although the focus is placed on the operational phase of projects, much of the guidance also applies to construction and decommissioning activities.

3.11. Regulations and Guidelines regarding SEA/SH and GBV

3.11.1. National Regulations

National laws, regulations and strategies include some provision to address issues regarding sexual exploitation and abuse and sexual harassment. The key document in this regard is the Charter of Women's Rights that was issued in 2008 by the Ministry of Women Affairs (MoWA) and a coalition of civil society organizations. The charter includes the Declaration on the Elimination of Discrimination against Women, which provides for the protection of women from all forms of violence against them in the workplace, particularly harassment.

On the other hand, the MoEHE Strategic Plan for 2017–2022 commits to achieving inclusion and equality by focusing on health education, awareness on sexual and reproductive health, and issues relating to combating child marriages, discrimination, violence, and inequality.

3.11.2. ILO Violence and Harassment Convention, 2019 (No. 190)

The Violence and Harassment Convention (No. 190) and its accompanying Recommendation (No. 206) were adopted in June 2019, at the Centenary Conference of the International Labour Organization (ILO). The convention sets out a common framework to prevent and address violence and harassment, based on an inclusive, integrated and gender-responsive approach.

The Convention recognizes that everyone has the right to a world of work free from violence and harassment, including gender-based violence and harassment. It offers broad protection and applies to the public and private sectors, to the formal and informal economy, and in

urban and rural areas. The Convention defines violence and harassment as “a range of unacceptable behaviours and practices, or threats thereof, whether a single occurrence or repeated, that aim at, result in or are likely to result in physical, psychological, sexual or economic harm, and includes gender-based violence and harassment.” Gender-based violence and harassment is then defined as “violence and harassment directed at persons because of their sex or gender, or affecting persons of a particular sex or gender disproportionately, and includes sexual harassment”.

Specific measures are required under the convention in the context of gender-based violence and harassment, including adopting prevention and protection measures such as workplace risk assessments that take into account hazards and risks that arise from discrimination, abuse of power relations, and gender, cultural and social norms supporting violence and harassment. The Convention also calls for providing victims with effective access to gender-responsive, safe and effective complaint and dispute resolution mechanisms, support, services and remedies.

4. Baseline Conditions

This chapter presents and identifies relevant site-specific baseline data on the characteristics of the sites for different sub-projects based on the field visits conducted by the consultant, the interviews with stakeholders and the review of relevant documents. It provides baseline information for each site on the location and land use, biological resources, air quality and noise levels, current energy sources, and historical and cultural heritage. It also provides general information regarding employment and livelihood in the Gaza Strip.

4.1. Location of the Sub-Projects Sites

The Gaza Strip is a narrow area of land bordering the eastern coast of the Mediterranean Sea located in the south-west area of Palestine. The Gaza Strip is about 42 km long and between 6 to 13 km wide, and its total area is 365 km^2. The project sites are distributed across different areas in the Gaza Strip. The location and coordinates for each site are illustrated in Table 4-1.

Table 4-1: Location of the sub-project sites

	Site	Location	Coordinates (Palestinian Grid 1923)	
			X	Y
Schools	Sumaya Bint Kheyat Primary School	Al Zaytoun neighborhood-Gaza City	98067.547	100694.816
	Al Farabi Primary School	Al Yarmouk Street-Gaza City	98265.782	102868.891
	Al Rafi'i Primary School	Down town in Jabalia City	101100.311	103885.924
	Ashaymaa Primary School	Al Shaymaa neighborhood-Beit Lahia	102805.274	107496.164
	Deir Al Balah Primary School	Deir Al Balah city center	88180.430	91953.944
	Hatem Atta'i Primary school	Al Bahar Street-Khan Younis City	82883.612	84298.432
	Oqba bin Nafe' Primary School	Tel al Sultan Camp-Rafah	77595.636	80351.270
Households	HH1	West of Deir Al Balah-Middle area	86795.94	92283.34
	HH2	Al Maghazi Camp-Middle area	90908.86	92820.59
	HH3	Al Naser neighborhood-Gaza City	98600.06	104385
	HH4	Al Naser neighborhood-Gaza City	97745.16	103915.1
	HH5	Sheikh Redwan neighborhood-Gaza City	99038.98	104582.5

As discussed earlier in Chapter 2, the PV will be rooftop installations. The main information regarding the available area, on-site utilities and services, electrical safety concerns, and surroundings of each of the 12 sites is discussed in the following sections.

4.1.1. Location of Sumaya Bint Kheyat School

The site of Sumaya Bint Kheyat School is located in residential area in Al Zaytoun neighborhood in Gaza City (See Figure 4-1 for the site location map). The surroundings of the proposed site for PV installations are residential buildings to the north, the school yard to the south, another school (Ain Jalout School) to the west, and an empty land followed by a residential building to the east.

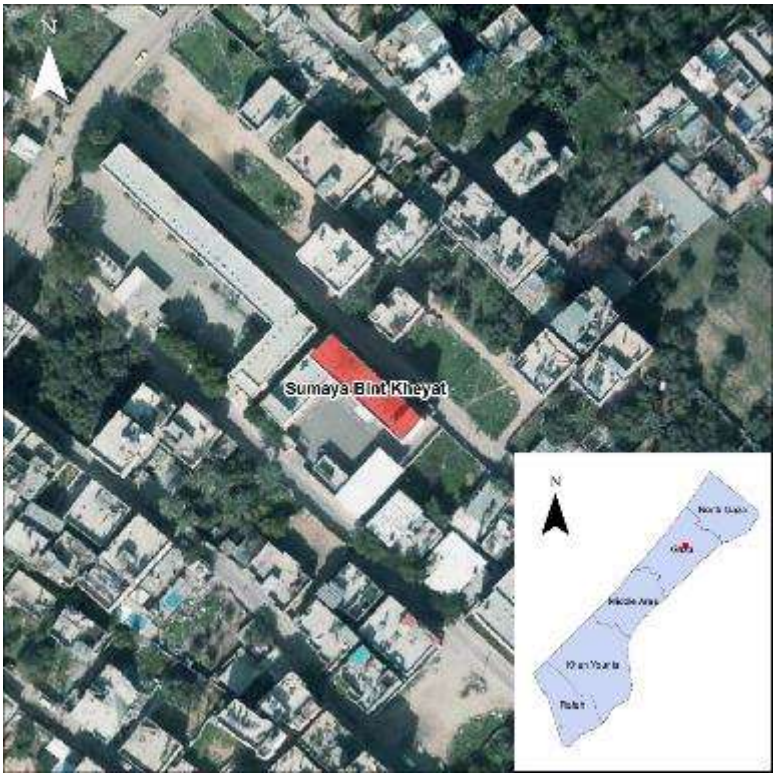


Figure 4-1: Sumaya Bint Kheyat School Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the school building; site visits showed that the proposed site is stable and accessible.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at Sumaya Bint Kheyat School; the roof is empty. Photos for the site are shown in Annex 2.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.2. Location of Al Farabi School

The site of Al Farabi School is located in a residential/commercial area in Gaza city (See Figure 4-2 for the site location map). The surroundings of the proposed site for PV installations are a main road followed by residential buildings to the west, Al Farabi and Al Moa’tasem Billah

schools yards to the east, the roof of another building at the school to the south and the roof of Al Moa'tasem Billah School to the north.

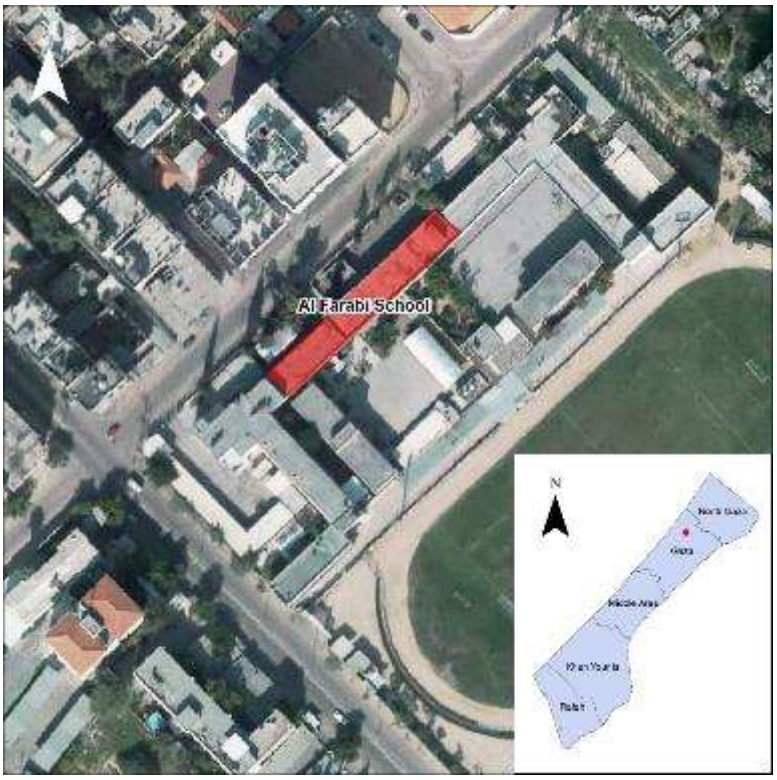


Figure 4-2: Al Farabi School Site Location Map

Access road: The site access road is a main paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the school building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at Al Farabi School; the roof is empty. Photos for the site are shown in Annex 2.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.3. Location Al Rafi'i School

The site of Al Rafi'i School is located in a residential area with medium population density in Jabalia City (See Figure 4-3 for the site location map). A mosque is found to the west of the site of the proposed site for PV installations, a yard and a road are found to the south, the roof of another building at the school to the east, and Al Naqab Primary School to the north.

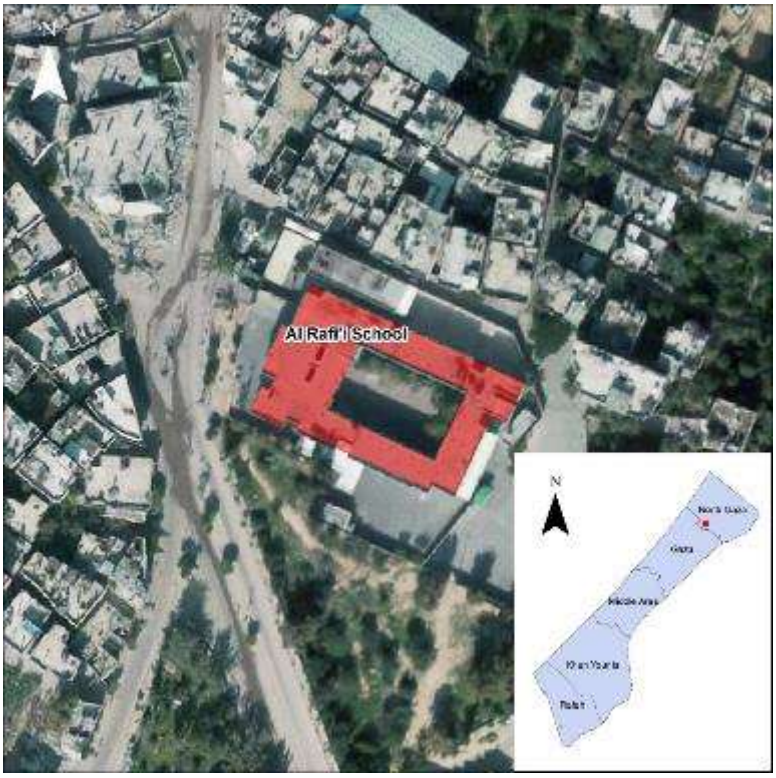


Figure 4-3: Al Rafi'i School Site Location Map

Access road: The site access road is a main paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the school's building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at Al Rafi'i School; the roof is empty. Photos for the site are shown in Annex 2.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.4. Location Ashaymaa School

The site of Ashaymaa School is located in residential area with medium population density in Beit Lahia City (See Figure 4-4 for the site location map). The site is surrounded by the school yard to the east and south, a road to the north, and the school playground and an agricultural land to the west.

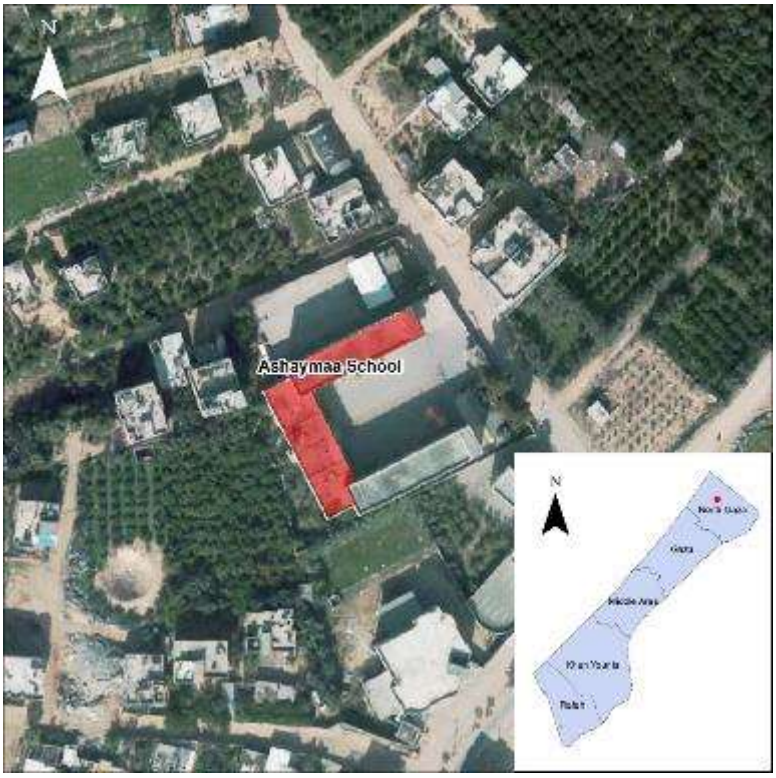


Figure 4-4: Ashaymaa School Site Location Map

Access road: The site access road is a paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the school's building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at Ashaymaa School are an existing on-grid PV system that will be dismantled and moved to another location by the Ministry of Education, given its ineffectiveness in providing the school with its needs of electricity. The system will be dismantled and removed ahead of the new system installation. Photos for the site are shown in Annex 2.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.5. Location of Deir Al Balah School

The site of Deir Al Balah School is located in a residential area in Deir Al Balah (See Figure 4-5 for the site location map). The surroundings of the proposed site for PV installations are the school yard to east, the roofs of other buildings at the school to the north and south, and Deir Al Balah Health Clinic to the west.

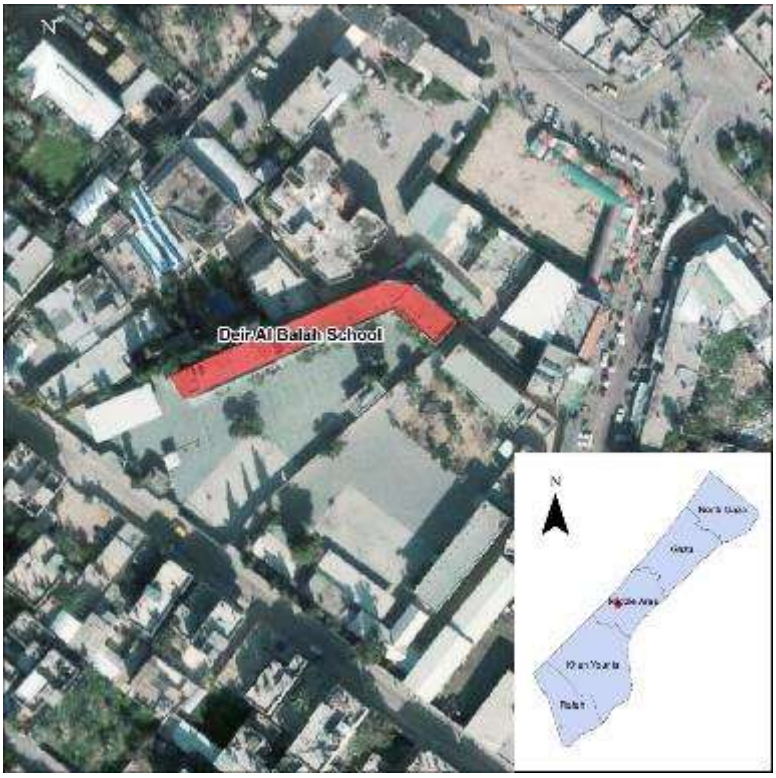


Figure 4-5: Deir Al Balah School Site Location Map

Access road: The site access road is a paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the school's building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at Deir Al Balah School; the roof is empty. Photos for the site are shown in Annex 2.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.6. Location of Hatem Atta'i School

The site of Hatem Atta'i School is located a main road in Khan Younis City (See Figure 4-6 for the site location map). The proposed site for PV installations at the school the school yard to the north, a sport club to the south, an agricultural land to the east and a school to the west.

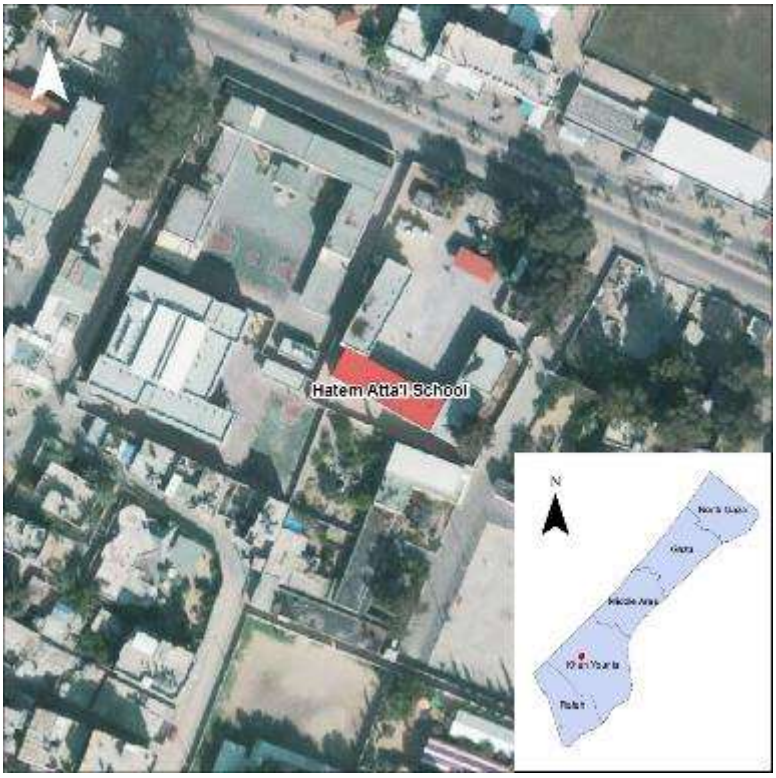


Figure 4-6: Hatem Atta'i School Site Location Map

Access road: The site access road is a main paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the school's building; site visits showed that the proposed site is accessible and stable but has no walls.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at Hatem Atta'i School; the roof is empty. Photos for the site are shown in Annex 2.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.7. Location of Oqba bin Nafe' School

The site of Oqba bin Nafe' School is located in a residential area in Tel Al Sultan Area in Rafah Governorate (See Figure 4-7 for the site location map). The surroundings of the proposed site for PV installations are the school yard to the north and east, the roof of another building at the school to south, and a main road to the west.

Figure 4-7: Oqba bin Nafe' School Site Location Map

Access road: The site access road is a paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the school's building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at Oqba bin Nafe' School; the roof is empty. Photos for the site are shown in Annex 2.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.8. Location of HH1

The site of HH1 is located in a residential area with low population density in the west of Deir Al Balah municipality (See Figure 4-8 for the site location map). The surroundings of the proposed site for PV installations are residential buildings and agricultural lands to the north and west, an agricultural land to the east, and agricultural lands to the south.

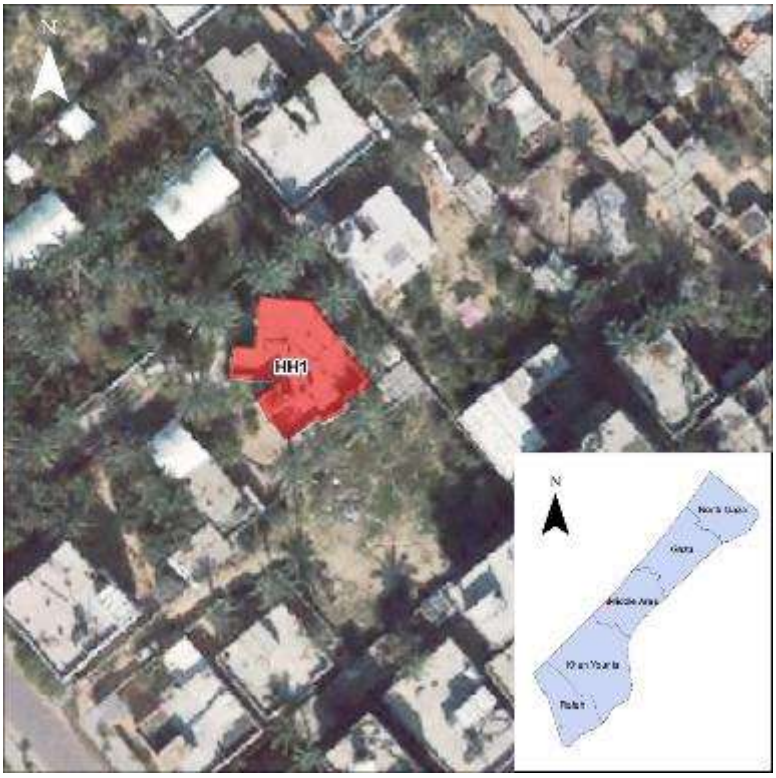


Figure 4-8: HH1 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at HH1. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.9. Location of HH2

The site of HH2 is located near Al Maghazi Public Park in Al Maghazi Camp in the Middle Governorate (See Figure 4-9 for the site location map). The surroundings of the proposed site for PV installations are residential buildings to the east and north, a road followed by the public park to the west, and an agricultural land followed by residential buildings to the south.

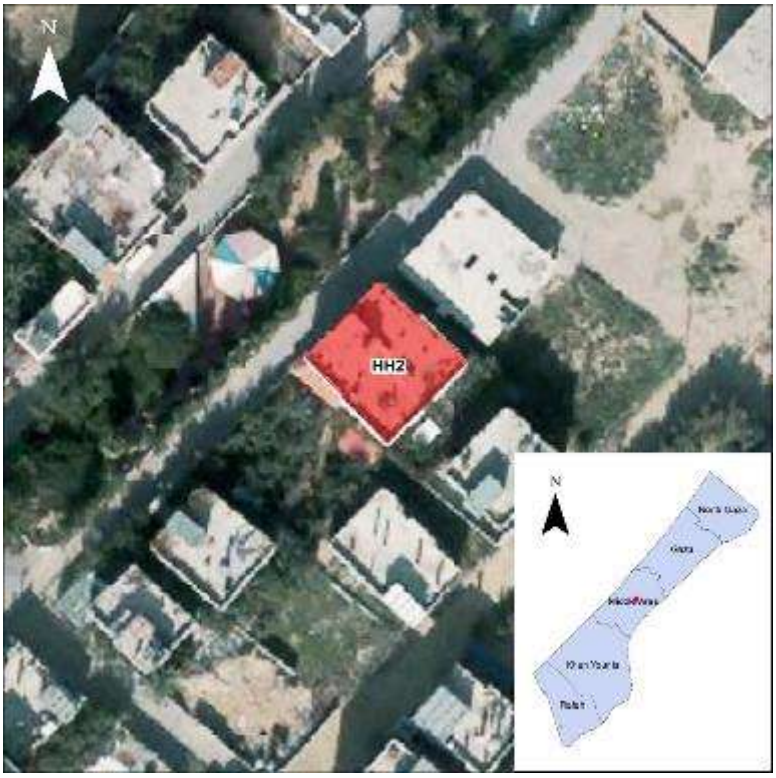


Figure 4-9: HH2 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at HH2. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.10. Location of HH3

The site of HH3 is located in a residential area in Al Naser neighborhood in Gaza City (See Figure 4-10 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings to the north, east and west, and a main road followed by residential buildings to the south.

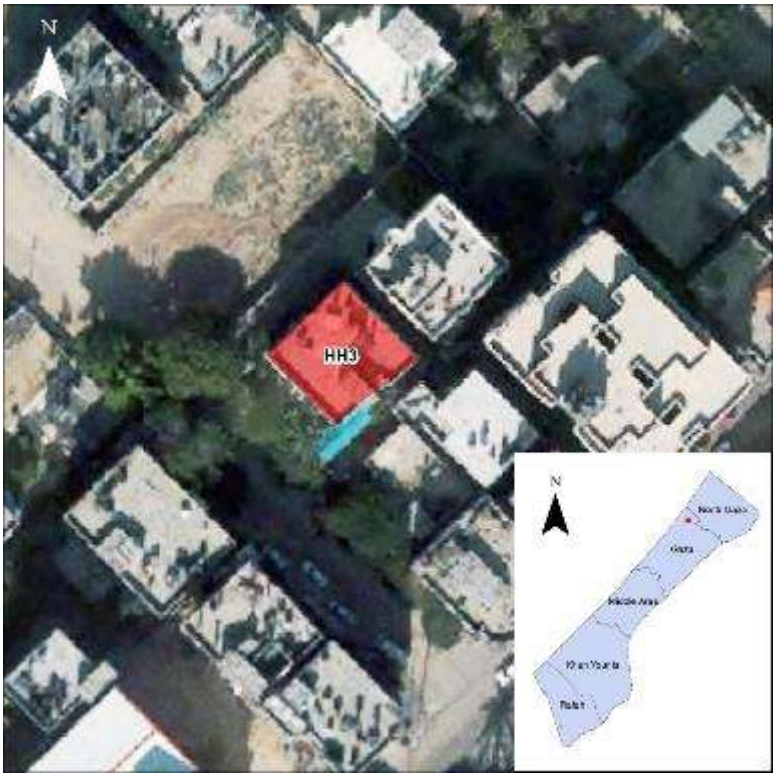


Figure 4-10: HH3 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at HH3. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.11. Location of HH4

The site of HH4 is located in a residential area along Al Nasr Street Gaza City (See Figure 4-11 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings to the east and north and paved roads followed by residential buildings to the west and south.

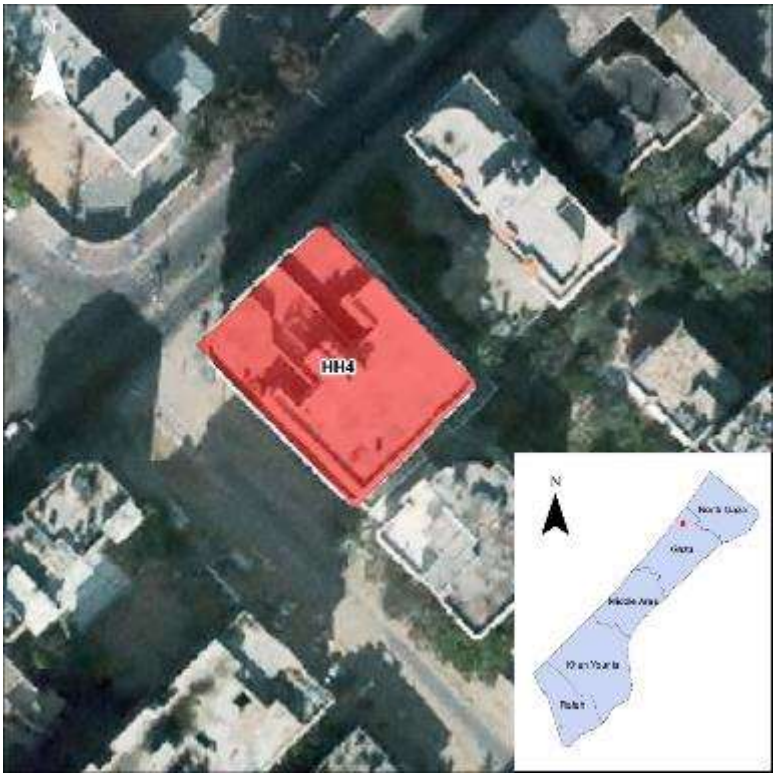


Figure 4-11: HH4 Site Location Map

Access road: The site access road is a paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area at the roof of the building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the PV installations' site at HH4. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.1.12. Location of HH5

The site of HH5 is located in a residential area in Sheikh Redwan neighborhood in Gaza City (See Figure 4-12 for the site location map). Therefore, the surroundings of the proposed site for PV installations are agricultural lands from all directions.

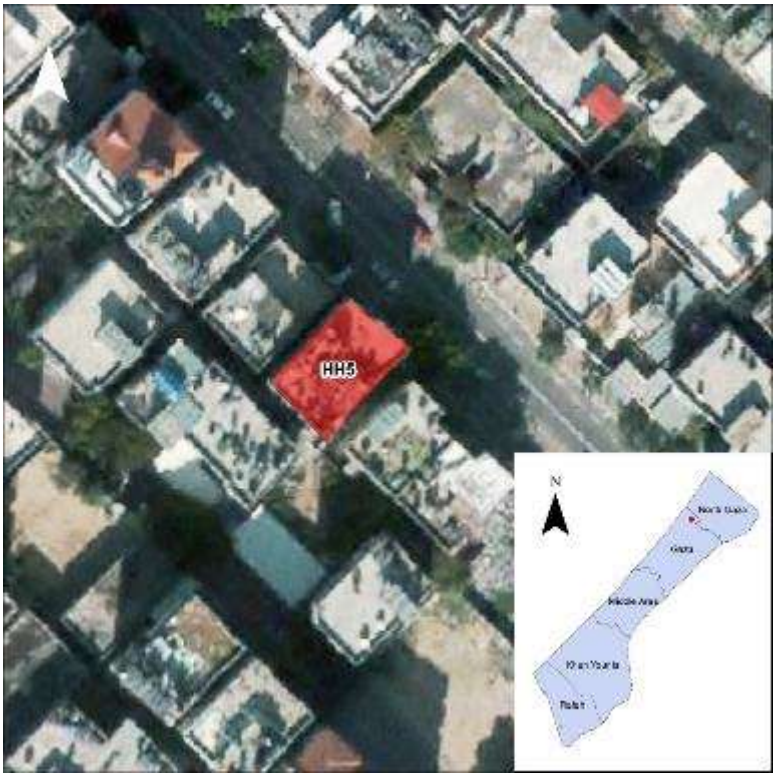


Figure 4-12: HH5 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No on-site services and utilities are found in the PV installations' site at HH5, yet a steel cover structure at the north-western part of the roof and bed will need to be removed in order to create enough shade-free area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the building).

4.2. Biological Resources

In spite of its very small area and crowded population, the Gaza Strip has interesting biodiversity elements in terms of species, habitats and ecosystems (Abd Rabou, 2009). Vertebrate wildlife species, including wild mammals, birds, reptiles and amphibians, are common in the Gaza Strip. The project sites are located commonly surrounded by residential areas that have no specific significant faunistic species or habitats.

Moreover, according to the conducted site visits and the reviewed literature, which includes scientific publications and reports, it was confirmed that no specific significant floristic species

are witnessed in the sub-project areas, other than some regular common species such as shrubs and herbaceous plants that can be found in surrounding areas.

4.3. Air Quality and Noise level

Available data on ambient air quality in Gaza are very limited. Some site specific monitoring campaigns were carried out during the past five years. The only integrated study that covers different areas in the Gaza Strip was carried out in 2005 by the Environmental Protection and Research Institute. The pollutants of concern included sulfur dioxide (SO2), nitrogen oxides (NOx), and Lead (Pb) (EPRI, 2006).

According to this study (EPRI, 2006); the average annual SO_2 concentration, in Gaza, North Gaza, Middle Area, and South governorates, is about 180, 70, 100, and 60 µg/m^3, respectively. While the average annual NOx concentration is about 42, 19, 27, and 17 µg/m^3 in Gaza, North Gaza, Middle Area, and South governorates, respectively. Moreover, the average annual lead concentration according to the same study is about 0.15 µg/m^3.

Another study conducted in 2016 (Al Madhoun et al., 2016) revealed that the mean CO2 concentrations at different locations in the Gaza Strip, which included main crowded streets as well as minor streets, range between 341-518 ppm, which is very close to or higher than the agreeable international level of CO2 (350 ppm).

With regards to noise levels, all of the 12 sub-projects sites are located in urban areas, with medium to high traffic activities identified in the vicinity of the sites and all of the 12 sites contain diesel generators with different capacities. A recent study (Al Madhoun et al., 2013), measured the traffic noise level at various development sites of different traffic volumes in Gaza City (urban, rural and camps, showed that the average noise level during weekdays in the urban areas ranged from 69.57 dB to 87.88 dB.

4.4. Energy

As mentioned earlier in Chapter 1 of this report, rolling power cuts in the Gaza Strip, which occur from 12 to 18 hours daily, have led to a very unpredictable and discontinuous supply. Accordingly, the current power supply in the schools and households targeted in this package has been designed to cope with the constraints of the power supply in Gaza.

The loads and devices that depend on electricity vary between schools and households and varies also from one site to another. For schools, most activities and appliances need electricity for limited time during the school's working hours, these mainly include lights for classrooms, computer devices for the school administration and for the computer labs.

The existing power supply options in the 12 sub-projects sites include mainly an external supply from the Gaza Electricity Distribution Corporation (GEDCo) grid. Some of the target schools have old and ineffective emergency diesel generators for on-site generation to cover the load of the main devices in the school during power cuts. Moreover, some of the target households use an external supply from private diesel generators, where the household pays about 4 NIS per one kW it consumes from these generators. Most of the households also use UPS batteries to store energy to be used during power cuts to cover the operation of lights and/or some other devices that consume little power.

4.5. Employment and Livelihood

Unemployment in the Gaza strip has been persistently high. According to percentage distribution of labor force participants, the general unemployment rate was 48.2% among labor force participants. The working youth in the Gaza Strip engages is somewhat different economic activities. Most employed young persons in the Gaza Strip work in trading, followed by services and industry (PCBS, 2018).

Temporary employment is dominant in the Gaza Strip. Many jobs are characterized by daily wages and short-term contracts. In 2018, the average daily wage recorded for wage employees in the Gaza Strip was 62.6 NIS. Although this might be a relatively higher rate compared to other developing countries, it is still too low to allow families to meet daily basic needs, given relatively high prices for basic commodities as a result of blockade and several economic restrictions. The poverty rate is considered to be growing amongst Palestinians in the Gaza Strip that the poverty rate in Gaza reached 53.6% by 2017, while the deep poverty rate reached 33.8%.

4.6. Historical and Cultural Heritage

The archaeological sites and historical buildings in the Gaza Strip vary between monuments, mosaic sites, mosques, churches and others. Based on desk study review and observations from the conducted site visits, it is confirmed that no traces of archaeological and cultural heritage have been found at the proposed project sites.

5. Public Consultation and Grievance Redress Mechanism

The following sections will discuss the stakeholders' identification, engagement and consultation, including the main concerns that were raised during the consultation activities. The sections also discuss the grievance redress mechanism for this project.

5.1. Public Consultation

As part of the ESMP, many activities were carried out to ensure the adequate engagement of stakeholders. The first step of this process was the identification of project Stakeholders. Stakeholders may include locally affected community groups or individuals and their formal and informal representatives, national or local public authorities, civil society and community-based organizations and groups with special interests. Then, the identified stakeholders were approached and engaged as discussed hereafter.

Stakeholders Identification

In order to capture stakeholders, who are directly or indirectly affected by the project (project-affected people) along with other relevant stakeholders, two approaches were adopted as follows:

- Identification of stakeholders based on geographical location: these include the neighbors of the sub-projects sites who might be affected by the project during different phases.
- Identification of stakeholders based on their interest and influence: these include the project beneficiaries (5 households and 7 schools), as well as national public institutions concerned with the project, e.g. PENRA and GEDCo.

Stakeholders Engagement and Consultation

In order to ensure the proper engagement of the identified Project Affected Persons (PAPs) and other relevant stakeholders, and given the current conditions due to the restrictions imposed as a result of the outbreak of Covid-19 in the Gaza Strip, the consultation activities during the course of the study were limited to individual meetings, taking in consideration World Bank's Covid-19 protocols for public consultations and stakeholder engagement (Annex 3)

Representatives of the seven schools and owners of the five households were approached at their sites through individual meetings that took place between March 18 and March 25. During these meetings, the sub-project components, locations and baseline conditions of the proposed sites were reviewed. The environmental and social requirements were also addressed, where the proposed ESMP and some of the anticipated environmental and social risks and impacts were discussed. The interviewees were informed about the grievance redress mechanism that is available to address the complaints, opinions and suggestions related to the project (Leaflets showing this information were also provided to them). The general opinions and concerns from the interviewed personnel were incorporated and addressed within this report. The feedback, comments, and concerns of each interviewee, which are summarized in Table 5-1, were taken into consideration during the impact assessment process, as discussed in Chapter 6 of this report, and specific mitigation measures and monitoring activities were proposed accordingly, as thoroughly discussed in Table 7-1.

Moreover, neighbors of the sites who are expected to experience nuisance from noise generated during the implementation of the system or from heat and light reflection from the

installed PV systems during operation, were also approached through interviews. These meetings have also discussed the existing GRM (Leaflets showing GRM channels were provided to them) that is meant to address the complaints, opinions and suggestions related to the project (See Table 5-1). Photos during different meetings are attached in Annex 4.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Project beneficiaries/Schools					
Mrs. Sawsan Nofal - Principal	Sumaya Bint Kheyat Primary School	Gaza city	March 20, 2021	- Project environmental and social requirements - The existing energy sources and energy requirements at the school. - The site conditions in terms of available area, existing utilities, safety concerns and biological resources. - The existing GRM for the project - Key issues regarding the O&M of the systems	- The school administration is aware of the existing E&S framework of the project and this ESMP as well as the E&S monitoring activities and requirements that will take place during the system installation and operation. - The school is a primary school (The first grade to the sixth grade) that operates in two shifts; the morning shift runs from 7:00 AM to 11:10 AM, and the afternoon shift runs from 11:40 AM to 03:30 PM. No construction activities should take place during these hours. - Electricity is essential for the operation of administrative offices at the school and to light up the classes. The available sources of energy include, along with the electricity from GEDCo grid, an old and ineffective diesel generator of 5 kWp capacity. - No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The school roof is empty, and thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The school administration is aware of the existing GRM objectives, channels and procedures. - The school administration is aware of the system components and the best practices to ensure the installed system’s sustainability and effective operation. They have also

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
					been informed about events and works that could require technical assistance from a qualified engineer/technician.
Mrs. Ne'ma Al Hawajri - Principal	Al Farabi Primary School	Gaza city	March 20, 2021	- Project environmental and social requirements - The existing energy sources and energy requirements at the school. - The site conditions in terms of available area, existing utilities, safety concerns and biological resources. - The existing GRM for the project - Key issues regarding the O&M of the systems	- The school administration is aware of the existing E&S framework of the project and this ESMP as well as the E&S monitoring activities and requirements that will take place during the system installation and operation. - The school is a primary school (The first grade to the sixth grade) that operates in two shifts; the morning shift runs from 7:00 AM to 11:10 AM, and the afternoon shift runs from 11:40 AM to 03:30 PM. No construction activities should take place during these hours. - Electricity is essential for the operation of administrative offices at the school and to light up the classes. The available sources of energy include only the unreliable electricity from GEDCo grid. - No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The school roof is empty, and thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The school administration is aware of the existing GRM objectives, channels and procedures. - The school administration is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. They have also

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
					been informed about events and works that could require technical assistance from a qualified engineer/technician.
Mr. Ashraf Al Kurd - Principal	Al Rafi'i Primary School	Jabalia	March 21, 2021	- Project environmental and social requirements - The existing energy sources and energy requirements at the school. - The site conditions in terms of available area, existing utilities, safety concerns and biological resources. - The existing GRM for the project - Key issues regarding the O&M of the systems	- The school administration is aware of the existing E&S framework of the project and this ESMP as well as the E&S monitoring activities and requirements that will take place during the system installation and operation. - The school is a primary school (The first grade to the sixth grade) that operates in two shifts; the morning shift runs from 7:00 AM to 11:10 AM, and the afternoon shift runs from 11:40 AM to 03:30 PM. No construction activities should take place during these hours. - Electricity is essential for the operation of administrative offices at the school and to light up the classes. The available sources of energy include, along with the electricity from GEDCo grid, a small-scale PV system that was previously used to operate a small-scale desalination unit; the system is now used to operate the computer, printers and lights at the principal office. - No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The school roof is empty, and thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The school administration is aware of the existing GRM objectives, channels and procedures.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
					- The school administration is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. They have also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Mrs. Siham Morjan - Principal	Ashaymaa Primary School	Beit Lahia	March 21, 2021	- Project environmental and social requirements - The existing energy sources and energy requirements at the school. - The site conditions in terms of available area, existing utilities, safety concerns and biological resources. - The existing GRM for the project - Key issues regarding the O&M of the systems	- The school administration is aware of the existing E&S framework of the project and this ESMP as well as the E&S monitoring activities and requirements that will take place during the system installation and operation. - The school is a primary school (The first grade to the sixth grade) that operates in two shifts; the morning shift runs from 7:00 AM to 11:10 AM, and the afternoon shift runs from 11:40 AM to 03:30 PM. No construction activities should take place during these hours. - Electricity is essential for the operation of administrative offices at the school and to light up the classes. Currently, the available sources of energy include only the unreliable electricity from GEDCo grid. A PV system was installed in 2015, the system is an on-grid system, which means that the system will shut off when the grid goes down, and thus it could not be operated given the current conditions of electricity cut off. The MoEHE will move the system to other locations, where a continuous availability of electricity in the grid is secured. - No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
					- The school roof is empty, and thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The school administration is aware of the existing GRM objectives, channels and procedures. - The school administration is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. They have also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Mr. Said Mizyed - Principal	Deir Al Balah Primary School	Deir Al Balah	March 25, 2021	- Project environmental and social requirements - The existing energy sources and energy requirements at the school. - The site conditions in terms of available area, existing utilities, safety concerns and biological resources. - The existing GRM for the project - Key issues regarding the O&M of the systems	- The school administration is aware of the existing E&S framework of the project and this ESMP as well as the E&S monitoring activities and requirements that will take place during the system installation and operation. - The school is a primary school (The first grade to the sixth grade) that operates in two shifts; the morning shift runs from 7:00 AM to 11:10 AM, and the afternoon shift runs from 11:40 AM to 03:30 PM. No construction activities should take place during these hours. - Electricity is essential for the operation of administrative offices at the school and to light up the classes. Given the current Covid-19 regulations related to online teaching; the electricity is also essential for teachers to upload their assignments. The available sources of energy include, along with the electricity from GEDCo grid, a back-up diesel generator. - No biological resources are found to be affected by the project activities.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
					- The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The school roof is empty, and thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The school administration is aware of the existing GRM objectives, channels and procedures. - The school administration is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. They have also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Mrs. Yusra Abu Aziz - Principal	Hatem Atta'i Primary school	Khan Younis	March 25, 2021	- Project environmental and social requirements - The existing energy sources and energy requirements at the school. - The site conditions in terms of available area, existing utilities, safety concerns and biological resources. - The existing GRM for the project - Key issues regarding the O&M of the systems	- The school administration is aware of the existing E&S framework of the project and this ESMP as well as the E&S monitoring activities and requirements that will take place during the system installation and operation. - The school is a primary school (The first grade to the sixth grade) that operates in two shifts; the morning shift runs from 7:00 AM to 11:10 AM, and the afternoon shift runs from 11:40 AM to 03:30 PM. No construction activities should take place during these hours. - Electricity is essential for the operation of administrative offices at the school and to light up the classes. The available sources of energy include, along with the electricity from GEDCo grid, an electricity line from the sport club located to the south of the school.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
					- No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The school roof is empty, and thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The school administration is aware of the existing GRM objectives, channels and procedures. - The school administration is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. They have also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Mrs. Khetam Al Absi – Principal Mr. Ayman Abu Taban - Assisstant	Oqba bin Nafe' Primary School	Rafah	March 25, 2021	- Project environmental and social requirements - The existing energy sources and energy requirements at the school. - The site conditions in terms of available area, existing utilities, safety concerns and biological resources. - The existing GRM for the project	- The school administration is aware of the existing E&S framework of the project and this ESMP as well as the E&S monitoring activities and requirements that will take place during the system installation and operation. - The school is a primary school (The first grade to the sixth grade) that operates in one shift that runs from 7:00 AM to 11:10 AM. No construction activities should take place during these hours. - Electricity is essential for the operation of administrative offices at the school and to light up the classes. The available sources of energy include, along with the electricity from GEDCo grid, a back-up diesel generator for emergency use only.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				- Key issues regarding the O&M of the systems	- No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The school roof is empty, and thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The school administration is aware of the existing GRM objectives, channels and procedures. - The school administration is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. They have also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Project beneficiaries/Households					
Sa'ad Baraka – Owner of HH1	HH1	Deir Al Balah	March 18, 2021	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources.	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities. - The household is very close to the sea and thus, special concern should be given to the durability of the system components especially in terms of corrosion resistance, given

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				- Available GRM for the project - Key issues regarding the O&M of the systems	the high levels of salinity and humidity of the seaside, and in terms of stability of the structure against high wind speeds. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The household roof is empty, thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The HH owner is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. He has also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Suliman Abu Mandeel – Owner of HH2	HH2	Al Maghazi	March 18, 2021	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The household roof is empty, thus no facilities/utilities/services are found to be relocated or removed during site preparation.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				- Key issues regarding the O&M of the systems	- The HH owner is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. He has also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Akram Al Sourani – Owner of HH3	HH3	Gaza city	March 17, 2021	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project - Key issues regarding the O&M of the systems	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The household roof is empty, thus no facilities/utilities/services are found to be relocated or removed during site preparation. - The HH owner is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. He has also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Adel Abu Kmail – Owner of HH4	HH4	Gaza city	March 17, 2021	- Project components, activities and specifications	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day, as

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				- Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project - Key issues regarding the O&M of the systems	well as electricity from an external private diesel generator that is operated for limited number of hours during power cuts, for which the household may pay about 300-400 NIS per month. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof. - The HH owner is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. He has also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Maher Ayesh – Owner of HH5	HH5	Gaza city	March 17, 2021	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area,	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				existing utilities, and biological resources. - Available GRM for the project - Key issues regarding the O&M of the systems	- The roof is stable and can be easily and safely accessed. In addition, the site and the surrounding area do not include any uncovered or unprotected cable or connections. - The available area for the proposed PV installations is sufficient that no utilities/objects are found to be removed or relocated. A steel cover that is installed to provide shade and privacy is found on the south-western part of the roof; this cover should be removed to provide a shade-free area for the PV installations. - The HH owner is aware of the system components and the best practices to ensure the installed system's sustainability and effective operation. He has also been informed about events and works that could require technical assistance from a qualified engineer/technician.
Neighbors of the sub-projects sites					
Safaa AbuJraiban- Principal of Ain Jalout School	Sumaya Bint Kheyat Primary School	Gaza city	March 20, 2021	-The impact of the sub-project on the neighbors of the project site during different project phases. - GRM process and available complaints channels.	- None of the neighbors of all 12 sub-projects sites have any problem with regards to the project construction or operation. - The consulted neighbors of different sites agreed that they are familiar with such projects and that the project would have an overall positive impact regardless the very limited and short-term nuisance during the construction phase. - The residents believe that such projects have many environmental, health and economic benefits. - The schools neighbors, believe that the projects will help in improving the learning environment at schools; one of the neighbors of Deir Al Balah School stated that her children
Saleh Sbaih- Principal of Al Moa'tasem Billah School And Ayman Al Saigali- neighbor of the school	Al Farabi Primary School	Gaza city	March 20, 2021		

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Nahed Muhsen – Principal of Al Naqab School	Al Rafi'i Primary School	Jabalia	March 21, 2021		usually have complaints regarding the poor visibility of the board at the class during electricity cut-off, especially in winter. - Principals of nearby schools, who were consulted as part of the engagement process, agreed that such projects are essential to improve the quality of schools environment, and to ensure education continuity under Covid-19 regulations, where online education became a must. - Some of the neighbors of the target households said that they are thinking of taking part in the project to install PV systems for their houses, given the easy payment mechanism, and the sustainability and reliability of PV systems, comparing to the current options they are using such as the external private generators.
Mohammed Abu Mhady- Manager of Ashaymaa clinic	Ashaymaa Primary School	Beit Lahia	March 21, 2021		
Nirmeen Abu Khader- Pharmacist (neighbor of the school)	Deir Al Balah Primary School	Deir Al Balah	March 25, 2021		
Dr. Mohammed Olwan- Manager at the Civil Defense center to the east of the school site	Hatem Atta'i Primary school	Khan Younis	March 25, 2021		
Deeb Abu Olwan- neighbor of the school	Oqba bin Nafe' Primary School	Rafah	March 25, 2021		
Hassan Baraka and Muneer Baraka- neighbors of HH1	HH1	Deir Al Balah	March 18, 2021		
Yousef Rabah and Tawfeeq Abu Mandeel – neighbors of HH2	HH2	Al Maghazi	March 18, 2021		

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Mohammed Al Swairki and Osama Al Whaidi- neighbors of HH3	HH3	Gaza city	March 17, 2021		

5.2. Grievance Redress Mechanism

The grievances related to the proposed activities for the health sector are limited to complaints from the surrounding communities during the different project phases. A grievance redress or complaints handling mechanism was created to ensure that PAPs have the access to a viable system to air grievances and to seek resolution with no intimidation or coerciveness. The grievance system is also important for PENRA and GEDCo to ensure they are accountable to complaints and that these complaints are handled transparently and efficiently.

A grievance redress mechanism has been established by PENRA for this project, and it is being used in coordination with GEDCo. The established GRM follows clear and smooth administrative procedures, in order to provide sufficient time and effort, and to optimize the complaints from the reception to completion or closure.

The following is a description of the Grievance Redress Mechanism (GRM) in use.

Definitions:

- **Complaint**: is an expression of written or verbal dissatisfaction by the complainant to the complaints officer in the headquarter of the electricity distribution company in the Gaza Strip expressing his dissatisfaction with service or damage caused to him as a result of the implementation of the project.
- **Complainant**: A person or company who has suffered damage due to the implementation of one of the components of the project or its implementation mechanisms or results.
- **Complaints Officer**: The customer service employee in GEDCo.

Procedures for receiving and handling complaints:

The following procedures aim to regulate and facilitate the process of receiving and handling complaints in order to develop and provide better service to the local community and rectify any harm suffered by the affected party as a result of the implementation of the 12 sub-projects within the various procedures and regulations.

First: Pre-complaint stage

The complainant should take into consideration when submitting the complaint the following things as they contribute to saving time and effort on the parties, which are as follows:

- The subject matter of the complaint is related to the components of the project and its implementation mechanisms or results.
- The complainant has suffered direct or indirect damage resulting from the implementation of the project.

Second: Receiving the complaint

Complaint Procedure:

- The complainant shall submit a complaint to the competent authority to receive complaints in one of the following ways:
  1. Personal attendance of the complainant at GEDCo headquarter or at PENRA office in Gaza.
  2. Electronically through the website of GEDCo, by completing the complaint form attached in the project dedicated page: http://eservices.gedco.ps/Complaint/.

3. Electronically by submitting the complaint via the electronic grievance form at PENRA website: http://www.penra.pna.ps/complaintForm.
4. Phone number of the GRM officer at GEDCo: 08 28 470 88 & at PENRA: 0562002451.
5. Using complaints box placed at PENRA offices in Gaza and Ramallah.

- The complainant to attend and submit a complaint to the competent staff in the complaints offices in GEDCo. or PENRA.
- If the complainant chooses to submit the complaint electronically via the website of GEDCo or PENRA, the computerized system will transfer the complaint electronically to the competent staff in the company.
- In case of telephone call, the complaint officer will receive and register the complaint.
- If the complainant uses complaints box, the complaints officer in PENRA, who will check the box on a daily basis, will move the complaints to the competent staff.
- The complainant shall fill in the form approved in writing and signed or electronically approved including all his data.
- The complainant shall attach any documents supporting the complaint if any.
- The employee responsible for verifying the data submitted in the form and handing over the complainant a follow-up ticket. In the event of filing a complaint through the system, the complainant receives a number that can follow up the complaint by telephone.
- The competent employee to enter the data of the complainant and the content of the complaint on the computerized system in the event that it was submitted in writing or through the phone.

Accept or reject the complaint and refer it to the competent authority:

- The concerned employee shall inform the complainant of accepting the complaint or rejecting it within *three working days* from the date of submission of it as a maximum.
- The competent officer shall refer the complaint to the competent authority to consider the complaint.
- The competent authority to which the complaint has been referred shall submit the response within *ten working days* from the date of receipt.
- The relevant Complaints Officer shall inform the Complainant of the readiness of the response and the necessity of attending to receive the reply in person.

Third: Studying the complaint and following-up

In the event of acceptance of the complaint, the competent complaints officer shall study the nature of the complaint and refer it to the competent authority as follows:

- Validating the information and documents attached to the complaint.
- Ask the complainant about any additional information about the complaint if necessary.
- Transfer the complaint to the competent authority.
- The competent authority to respond to the complaint and provide support if necessary.
- The complaints officer of GEDCo shall inform the complainant of the response.

Fourth: Closing the complaint and preparing reports

The complaint shall be closed in one of the following cases:

- If the subject of the complaint is not related to the components of the project and the mechanisms of its implementation or its results.
- After informing the complainant of the response and resolving the complaint.
- If the complainant asks to close the complaint or stop following it.
- If an amicable resolution of the complaint is reached.
- If the complaint is deemed to be malicious.

Complaints shall be submitted as follows:

- *Monthly reports* to the Director General of the Project Monitoring Unit of the Energy and Natural Resources Authority.
- *Quarterly reports* to the World Bank's competent authority.

Fifth: unsettled complaints:

- In case the complaint officer does not receive the response after exhausting the period mentioned above, the complaint is considered to be defective.
- The faulty complaint shall be forwarded by the responsible officer to the Director General of the Project monitoring Unit of PENRA Authority for processing and follow up, accompanied by recommendations and suggestions, provided that the response shall be within a maximum period of *ten working days*.
- If the Director General of the PMU does not receive any response regarding the complaint after addressing the competent authority within a period of *seven working days*, the Director General shall refer it to the Head of the Energy and Natural Resources Authority for appropriate action.

Sixth: appeals process:

Where the complainants are not satisfied with the internal procedures for handling complaints, the outcomes of the complaints or for any unhandled complaints, the complainants have right to refer their complaint to the Cabinet's Unit for grievances.

Once all possible redress has been proposed and if the complainant is still not satisfied then they should be advised of their right to legal recourse.

The GRM procedures has also been updated to include channels for managing complaints during COVID-19 pandemic and for managing anonymous and GBV related grievances as follows:

- **Managing complaints during COVID-19 pandemic**: In order to control the risks of virus transmission during Covid-19 pandemic, the complainants will be advised, when informed about the GRM during stakeholder consultation meetings and through other stakeholder engagement tools, to submit their complaints electronically or via telephone.

- **Additional codes and procedure to manage anonymous and GBV related grievances**: The GRM system will also include an anonymous complaint reporting process as some complainants may choose to file a complaint anonymously. Channels to accept and respond to anonymous grievances will be communicated to project affected parties during the consultation meetings and throughout project implementation. Anonymous complaints should provide factual details and specific allegations of misconduct or serious wrongdoing related to any of the project activities. The GRM staff shall ask the

complainant about the preferable way to inform him/her of the solution. The GRM system will include special referral pathways for the project-related GBV complaints and grievances, including grievances on sexual harassment and sexual exploitation and abuse.

6. Potential Environmental and Social Impacts and Mitigation

The main potential impacts that could arise from the different phases of the Project were identified and their significance was assessed so that any potentially significant impacts can be properly mitigated and monitored.

The identification and analysis of impacts consist of reviewing the design information submitted by PENRA, in conjunction with the baseline information of the project sites. Impacts from similar projects are also examined so as to identify potentially significant impacts on the environment and surrounding communities.

The key activities during the construction phase include the site clearance, mobilization of equipment, installation of mounting on roof structures and PV panels, and the electrical connections; while the main activities after the implementation of the system will include the normal operation activities and the maintenance activities.

The affected environmental and social parameters were identified based on the Environmental and Social Framework (ESMF) and the generic ESMP prepared for the project, the public consultations, the sites visits, and the experience of the consultant with similar projects. Then, the significance of the identified impacts was assessed taking into consideration different factors including nature, magnitude, geographical extent, timing, duration and reversibility of the impact. Identification of potential environmental and social impacts was facilitated by the use of the screening checklist provided in the project ESMF. The checklist was filled for each sub-project (See Annex 5); accordingly, the project environmental and social category and the site-specific impacts are determined, where all of the 12 sub-projects were found to fall under category B with manageable adverse environmental and social impacts.

Based on the screening process, the environmental and social elements of concern during the construction and operation and maintenance phases for the 12 sub-projects were defined are summarized in Table 6-1. Detailed discussion of the expected impacts on these elements is provided under sections 6.1 and 6.2.

Responding to the impacts identification and assessment, detailed site-specific mitigation measures were identified and evaluated in order to avoid, reduce or remedy the impacts associated with the project implementation during different phases.

The following environmental and social impacts and mitigation measures are specific for the 12 sub-projects sites, with more discussion made for site-specific issues at each of these 12 sites.

Table 6-1: Summary of the Environmental and Social Screening Results

Environmental/Social element		Relevant/ESMF checklist	Sumaya School		Al Farabi School		Al Rafi'i school		Ashaymaa School		Deir Al Balah School		Hatem Atta'i school		Oqba bin Nafe' school		HH1		HH2		HH3		HH4		HH5	
			C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Environmental	Biological Resources	Q3, Q8, Q9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Air quality	Q11	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-
	Noise Quality	Q19	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-
	Land Use	Q5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Water Resources	Q4, Q7, Q10, Q12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hazardous materials and waste	Q6, Q13	x	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X
Social	Public Health	Q13, Q16	x	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X
	Occupational Health and Safety	Q13, Q16	x	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X
	Employment	Q15	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-
	Livelihood	Q17, Q18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Energy Supply	-	x	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X
	Existing services and utilities	Q14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Protected areas and Cultural Heritage	Q2, Q3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nuisance to neighbors/neighboring properties	Q19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

6.1. Environmental Impacts

6.1.1. Impacts on Air Quality

Based on the assessment of the baseline conditions of air quality as provided in section 4.3 in relation to the proposed project activities at all sub-projects sites, the following Impacts have been recognized.

During Construction

The main sources of impact on air quality during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Taking into consideration the extent and nature of project activities, where transporting vehicles movement is limited and no excavation and backfilling works will take place, in addition to the baseline characteristics of air quality in different sub-projects sites, where diesel generators are being used and vehicles movement on roads around the sites is taking place; it can be concluded that the construction activities will not have significant impact on the air quality parameters in all 12 sites.

Mitigation measures

The following mitigation measures are recommended for controlling impacts on air quality during construction phase:

- Plan vehicle movements and do not overload vehicles to minimize exhaust emissions.
- Assure the use of well-maintained mechanical construction equipment.

Residual Impact

The impacts on air quality from dust and construction vehicles emissions are restricted spatially to the areas directly close to generation and decreasing significance with distance. The residual impacts on air quality during construction in all sub-projects sites are considered *negative short-term and insignificant*.

During Operation and Maintenance

The main sources of impact on air quality during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

The operation of the project will not produce any pollutants or greenhouse gases. Rather, it will have a positive indirect impact on the air quality as the solar energy will replace and/or reduce the use of other energy sources that have larger impacts on the air quality, i.e. the use of PV solar systems in the 12 sub-projects sites, especially the 7 schools sites, will reduce the operation times and the effective load of the emergency diesel generators and thus will reduce fuel consumption and greenhouse gas emissions as a result.

Mitigation Measures

No mitigation measures are required.

Residual Impact

The impact on air quality during the operation and maintenance phase is assed as *positive long-term impact with medium significance*.

6.1.2. Impacts on Noise Quality

The relevant baseline information for this section is presented in Section 4.3. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on noise quality during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Mostly, the construction phase for all sub-projects will include noise generating activities associated with operation of machinery, transport of materials in trucks, and installation of mounting structures and PV modules specially when working on the roofs. In general, the impact of construction noise depends on the proximity of the construction activities to noise sensitive receptors (NSRs), including residential areas, schools, worship places, clinics and hospitals. Therefore, as seven of the projects sites are schools and five are households located in residential areas, then the impact of construction noise will be of concern.

The assessment of the baseline noise conditions in each site revealed that the current noise levels at the majority of the project sites are relatively high (70-75 dB) due to the presence of on-site diesel generators and due to the proximity of most of them to heavy traffic roads. It is expected that the construction activities will add up more noise to the existing levels to reach about 85 dB during some activities. Such levels of noise exceed the Palestinian Outdoor Noise standards (PS 480-2005) and WBG/IFC guidelines (55 dB day time- 40 dB night time for residential areas where schools are found).

Mitigation Measures

The following mitigation measures are recommended for controlling noise impacts during construction phase:

- Comply with Palestinian Labor Law regarding provision of protective hearing devices and appropriate safety equipment to workers on construction sites, where construction works are expected to produce noise over an appropriate level.
- Apply OSHA 1910.95 (a) and OSHA 1910.95 (b) regarding exposure periods to different noise levels.
- Provide well-maintained construction vehicles and machinery, in order to minimize noise.

- Prohibit operating heavy or noisy machinery between the hours of 8:00 pm (20.00) and 6:00 am during working days and all day during Fridays or designated local holidays (unless the public will be best served during these hours and approval has been provided by local government, school administration and surrounding residents).
- Schedule working hours and work days taking into consideration working time at the schools for both shifts, to avoid using heavy machinery during school hours (downloading of PV panels and steel structures and uploading them to the roofs of the schools should take place after 03:30 pm).

Residual Impact

The residual impacts from noise during construction in all sub-projects sites are considered *negative short-term and with low significance*, given that the impacts are reduced with the application of the mitigation measures stated above and that the existing noise levels are already high.

During Operation and Maintenance

Positive long-term impacts with medium significance on noise quality are anticipated during the operation and maintenance of the project as the PV solar systems will replace/reduce the operation hours of the recently used diesel generators.

6.1.3. Hazardous Materials and Waste

The following impacts of hazardous materials and waste have been identified during different project phases.

During Construction

The main sources of hazardous materials and waste during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

No major hazardous materials and waste are expected to be generated during the construction of different sub-projects. The hazardous materials during construction are limited to chemicals from accidental damage or spillage of PV cells and/or batteries, such as lead, cadmium, and acids.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts of hazardous materials and waste during construction phase:

- Identify suppliers for different components of the PV system (PV panels, inverters and batteries) of ISO-or best industry standard-compliant products,
- Provide all necessary PPE for handling hazardous material depending on type and status of material.
- All workers should be familiar with hazardous waste warning signs.

Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous Waste Management Plan attached in Annex 6.

Residual Impact

The residual impacts from hazardous material and waste during construction of all project sites are considered *short-term, negative and of low significance*.

During Operation and Maintenance

The main sources of hazardous materials and waste during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

The only hazardous materials of concern during operation and maintenance of the PV solar systems are heavy metals, such as lead, cadmium, and acids present in PV panels manufacture and storage batteries, as well as waste of electrical appliances, and scrap metals. Therefore, the end-of-life disposal of storage batteries and the solar panels when they fail to perform efficiently could be a source of risk to the environment.

Any waste generated from the sub-projects, before, during and after installation must be disposed of at the EQA-designated disposal site. The storage batteries are estimated for replacement every three years. Currently, there are no legislations in the Gaza Strip to guide the disposal/ recycling of these hazardous materials, the private sector, however, works on collecting the wasted batteries for recycling. Many small private workshops collect the batteries for 10-15 NIS for each battery and then recycle them. If the battery waste is not collected by the private sector, then it should be disposed in the hazardous waste-designated area in authorized landfills, which is currently available in Juhr Al Deek Landfill in Gaza City.

Decommissioned solar panels have a very high negative impact on the environment due to the presence of some heavy metals used in their manufacture. They thus constitute hazardous waste and must also be disposed of under guidance from the EQA in the hazardous waste-designated area in Juhr Al Deek Landfill.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts of hazardous materials and waste during operation and maintenance phase:

- Dispose packaging and construction waste at approved waste management sites using registered transport services.
- Provide a temporary storage facility to contain disposed storage batteries and solar panels ahead of final disposal to EQA approved facility.
- Contract with recycling workshops/facilities capable of handling battery waste.
- Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous Waste Management Plan attached in Annex 6.

Residual Impact

The residual impacts from hazardous material and waste during operation and maintenance of all project sites are considered *long-term, negative and of medium significance*.

6.1.4. Non-hazardous Waste Management and Disposal

The following impacts of non-hazardous waste have been identified during different project phases.

During Construction

The main sources of non-hazardous waste during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Solid waste will be generated during site preparation and construction works. This is anticipated to include typical construction waste such as steel, packaging waste, scrap metals, and garbage. Poor construction waste management will negatively impact the environment as well as the aesthetics of the area if not properly collected, managed and disposed of at an approved landfill by the contractor.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts of non-hazardous waste during construction phase:

- Identify expected types and volumes of waste, how it will be stored, if required, and when and where it will be disposed of, where disposal should be done at a recognized landfill.
- Apply good housekeeping practices at all times in all project sites, including approved designated and protected areas for temporary waste storage, if required.
- Prohibit stockpiling of materials or generated construction waste on private areas, except as approved by the landowner.

Residual Impact

The residual impacts on solid waste management during construction on all project sites and of all proposed project components are considered ***insignificant***.

During Operation and Maintenance

There are not expected to be any particular significant issues for non-hazardous solid waste disposal during operation of the sub-projects.

6.2. Socio-economic Impacts

6.2.1. Impacts on Energy Supply

The relevant baseline information for this section is presented in Section 4.4. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on energy supply during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on electricity supply during construction are almost limited to temporary interruptions in electricity services during reallocation of electrical connections to accommodate the new system.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts on electricity and energy during construction phase:

- Work efficiently and within an expedited schedule for implementation of connections reallocation.

Residual Impact

The residual impact on energy and electricity supply during construction is considered as a *negative insignificant short- term impact*.

During Operation and Maintenance

The main sources of impact on energy during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

The anticipated long-term impacts of the project during operation include increased energy independence and security in case of conflict, longer hours of available power supply, and cleaner and cheaper alternative to private stand-by generators. The proposed systems are designed with sufficient capacities that will cover the basic energy needs of the schools and the households.

The impact on energy and electricity during the operation phase, taking into consideration periodic and adequate maintenance and cleaning of the new PV systems, is assed as *positive long-term impact with high significance*.

6.2.2. Impacts on Existing Utilities and Services

The relevant baseline information for this section is presented in Section 4.1. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on existing utilities and services during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on existing service utilities during construction include the interruption of services due to relocation of some utilities that might found on the roofs of the schools' or households buildings including solar water heaters, existing PV solar systems, water tanks. Given the available space on the target roofs, no utilities/services are found to be relocated or removed.

Mitigation Measures

No mitigation measures are required.

Residual Impact

The impacts on existing services and utilities during construction of PV installations in the 12 sites is *insignificant*.

During Operation and Maintenance

No impacts on existing utilities and services in any of the 12 sub-projects sites are anticipated during the operation and maintenance of the project.

6.2.3. Impacts on Public and Occupational Health and Safety

In relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on public and occupational health and safety during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on public and occupational health and safety during construction of PV systems could include physical hazards from falling and injuries, especially at Ashaymaa School, where the roof has no walls, as well as risks from movement of heavy machinery, and physical hazards from contact with hazardous material.

Impact on health and safety of workers and the public is of high priority during construction period. Workers are particularly susceptible to impacts from working from height, given that the PV installations in the 12 sites will be roof-top installations, as well as impacts from electrical shock if unprotected electrical cables are found within the working site.

On the other hand, as construction activities will take place at schools or households that are located in residential areas, students and public are also susceptible to safety risks during construction activities. Moreover, as several girls' schools are involved (i.e. female students and teachers), there would also be a potential risk of sexual exploitation and abuse and sexual harassment (SEA/SH).

Mitigation Measures

The following mitigation measures are recommended for controlling impacts on workers and public occupational health and safety during construction phase:

- The contractor shall Prepare, submit and implement health and safety plan (OHS) for PENRA approval prior to starting any project activities.
- The contractor shall prepare an Emergency Response Plan (ERP) in coordination with the relevant local authorities. The ERP should include clear procedures for evacuation, severe weather, lockdown, medical emergency, fire emergency, hazardous materials management, and working-during-pandemic; the ERP should also include information about the public emergency services.
- Comply with the provisions of labor law and the World Bank guidelines on the mitigation of Sexual Exploitation and Abuse such as the signing of enforceable workers' codes of conduct.
- Code of Conduct shall be written in local language; Codes of Conducts and provisions related to SEA/SH shall be incorporated into the bidding documents.
- The project's level GM will include specific procedures for SEA/SH including confidential reporting and ethical documentation of GBV cases.
- Comply with the Secondary Legislations associated with the Palestinian Labor Law, particularly the Ministerial Cabinet Order No.49, Year 2004 about protection measures from work risks and illnesses and Guidelines No.1, year 2005 on provision of precautionary measures to protect workers at construction sites.
- Comply with the Palestinian Child Law article 14 and the International labor Organization (ILO) agreement, where the child of age under 18 years will not be employed or engaged in the project.
- All workers shall be insured by the contractor for any potential work accidents and injuries according to the Palestinian Labor Law.
- Provide adequate personal protective equipment (PPE) including hard hats, safety goggles, and other appropriate safety equipment to protect workers from injury.
- Respect all safety measures required for working on rooftops. Apply the OSHA roofing works measures (OSHA 29 CFR 1926.502 (j) (7)) during the installation of roof-top PV systems.
- Schedule working hours and work days taking into consideration working time at the schools for both shifts, where no construction activities should take place during school hours (downloading of PV panels and steel structures and uploading them to the roofs of the schools should take place after 03:30 pm).
- Consider suitable engineering and occupational health and safety practices during site preparation in areas where unprotected electrical cables and unstable objects are stored and exist. Keep a careful watch for cables during construction; do not use handheld power tools within close distance of any electricity cable unless the cable is safely covered, and keep walkways and stairways free of unstable objects and wastes.
- For all installation activities at Hatem Atta'i school, and when working near the roof edge in other sites, additional safety measures should be considered to enhance workers safety; a roofer's kit should be used, the kit is to be installed and maintained consistent with the manufacturer's instructions.

- The GRM system will include special referral pathways for project related GBV complaints and grievances, including grievances on sexual harassment and sexual exploitation and abuse.
- Mechanisms for communicating grievances shall be made available for all workers.
- Ensure workers' access to clean water and sanitation services, which could be provided in coordination with the schools administration at schools and with HHs owners at HHs, given the very short period of implementation, where the provision of a separate source of water and sanitation services will not be feasible.
- The contractor will hire local workers to minimize Labor influx from far governorates.

The above mentioned impacts and mitigation measures cover the potential impacts and mitigation measures for the 12 specific sites during normal conditions. However, some specific measure should be considered during the current Covid-19 pandemic. The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or exhales. One can be infected by breathing in the virus when within close proximity of someone who has COVID-19, or by touching a contaminated surface and then his/her eyes, nose or mouth. Therefore, in order to ensure the safety of the public and the workers during the construction activities, the Contractor should commit to the Ministry of Health/WHO guidelines regarding Covid-19 including but not limited to the following specific measures:

- Ensure frequent, sustained hand washing and use of hand sanitizers. All of the installations crews should refrain from shaking hands or other close-proximity interactions.
- Disinfect frequently touched surfaces on the work site after installation such as the electrical panel, ladders, and solar equipment.
- The number of installers should be reduced in order to practice social distancing.

Residual Impact

The impacts on public and occupational health and safety during construction cannot be completely avoided but their chances and magnitude can be minimized with the application of mitigation measures, given that accidents may still potentially occur. Therefore, the residual impact is considered as a *negative short-term impact with low significance.*

During Operation and Maintenance

The main sources of impact on public and occupational health and safety during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on occupational health and safety during operation and maintenance of PV systems include the risk on engineer/technician health during the maintenance of PV modules and related inverters and other electrical devices (i.e. electric shocks), and the maintenance of batteries. In addition to physical hazards from falling and injuries due to mechanical reconstruction works.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts on occupational health and safety during operation and maintenance phase:

- Training of the systems operators at schools and system owners at each household on the basic instructions for the operation of the system and related inverters and other electrical devices.
- Works on electrical instrumentation and protective equipment must be carried out only by a qualified engineer and technician/s. School staff/household owner is not allowed to continue with maintenance unless the functional state of protective equipment is ensured.
- Power supply connections and breakers should be kept secure against unexpected restart and a warning label must be attached against restarting.
- The system control room/cabinet must contain all safety measures such as firefighters, free of flammable materials, natural and artificial ventilation, and under the eyes of guards.
- A drawing on the control room/cabinet shall provide warning about safety hazards, e.g. smoking, acid handling, as well as emergency shutdown procedures, etc.

Residual Impact

The residual impact on occupational health and safety during operation and maintenance of the project is considered as a *negative short-term impact with low significance*.

6.2.4. Impacts on Employment & Livelihood

The relevant baseline information for this section is presented in Section 4.5. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on employment during construction activities are discussed hereafter.

Impacts

It is anticipated that the construction activities will create job opportunities for the local community and will provide a temporary source of income over the construction period. Installation crews will mainly be local skilled and semi-skilled labors from the Gaza Strip.

The impacts on employment during construction from all sub-projects components are considered of a *temporary low significant positive impact* due to the limited number of workers who will be involved.

During Operation and Maintenance

The main sources of impact on employment during operation and maintenance activities are discussed hereafter.

Impacts

The project operation and maintenance may have a small direct effect on employment opportunities. A limited number of new jobs may be created for operation and maintenance of the new systems, and associated training may lead to improved capacity of the local workforce to manage and operate PV solar systems.

Mitigation measures

No mitigation measures are required.

Residual Impact

The impact on employment opportunities during operation and maintenance from all sub-projects is considered to be a *long-term, positive, low significant impact*.

Table 6-2 summarizes the environmental and social impacts of the project. It provides the duration and time scale of each impact as well as the residual impact after the implementation of the proposed mitigation measures.

Table 6-2: Potential Impacts Significance

	Issue	Phase	Time scale	Residual Impact
Environmental Issues	**Air Quality**	Construction	Short-term	Negative and insignificant
		O&M	Long-term	Positive with medium significance
	Noise Quality	Construction	Short-term	Negative with low significance
		O&M	Long-term	Positive with medium significance
	Biological Resources	Construction	Short-term	Negative with low significance
		O&M	Long-term	Negative with low significance
	Hazardous Materials and Waste	Construction	Short-term	Negative with low significance
		O&M	Long-term	Negative with medium significance
	Non-hazardous Waste Management and Disposal	Construction	Short-term	Negative and insignificant
		O&M	---	----
Socio-economic	**Energy Supply**	Construction	Short-term	Negative and insignificant
		O&M	Long-term	Positive with high significance
	Existing Utilities and Services	Construction	Short-term	Insignificant

Table 6-2: Potential Impacts Significance

	Issue	Phase	Time scale	Residual Impact
		O&M	---	---
	Public and Occupational Health and Safety	Construction	Short-term	Negative with low significance
		O&M	Short-term	Negative with low significance
	Employment and Livelihood	Construction	Short-term	Positive with low significance
		O&M	Long-term	Positive with low significance

7. Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) is a combination of the proposed mitigation measures for the anticipated impacts and the monitoring plan, which is designed to: 1) ensure that the prediction for the impacts is accurate and 2) assure that the mitigation measures are implemented and they are effective in performing the objectives. The monitoring plan includes the monitoring activities (How?), the responsible party for monitoring (Who?), and the frequency of monitoring (How many?). The ESMP is designed to cover the different phases of the project.

The generated ESMP is mainly built upon the ESMF and the generic ESMP prepared for this project, and adjusted/updated, where required, based on the findings of the data collection and impact assessment processes for this assignment.

The ESMP provided in Table 7-1 lists the main expected impacts in all sub-projects sites. Mitigation measures to be implemented during the construction and operational and maintenance phases are also listed. Environmental and social mitigation and monitoring actions are presented in a matrix format. The matrix includes an identification of the issues, mitigation measures, and responsibility for executing the mitigation measures and monitoring actions.

7.1. Contractual commitments of the ESMP

The ESMP is designed to monitor the effectiveness of the identified mitigation actions, during and after construction. This ESMP should be incorporated in the bidding documents to be issued to contractors, and should also be part of the awarded contracts to these contractors. Moreover, the environmental and social clauses in this ESMP to be included in the ToRs and tender documents including codes of conduct, coordination, monitoring, and reporting.

7.2. Responsible Parties

Mobilization and Construction Phases

A Supervision Engineer from PENRA, will be responsible for managing this plan and for periodic monitoring of the environmental and social aspects and overall compliance with the mitigation measures of this plan during the construction phase.

It is the construction contractor (CONTRACTOR)'s responsibility to take into account all the construction-related mitigation measures listed in this report; when planning and during the construction phase. And it is the Supervision Engineer's responsibility to monitor and document any changes in scope of the proposed project from any of the terms and conditions stated in this report. Both the CONTRACTOR and the Supervision Engineer from PENRA are the primary responsible parties for the mitigation and monitoring tasks during construction; and both shall adhere to informing and coordinating with all applicable stakeholders with relevance to their corresponding mandates.

The CONTRACTOR shall read, consider, and comply with the ESMP for this project. The CONTRACTOR shall act responsibly to provide notification of CONTRACTOR'S schedule to enable the Supervision Engineer to carry out his responsibilities.

The CONTRACTOR shall designate an environmental and social coordinator. This individual(s) shall have good general knowledge of environmental and social issues that are included in Table 7-1. This individual(s) shall be responsible for:

- Coordinating the CONTRACTOR'S work related to compliance with environmental and social mitigation measures.
- Working closely with the Supervision Engineer to ensure that the CONTRACTOR adequately understands the potential impacts, mitigation and monitoring requirements for implementation.
- Working closely with the Supervision Engineer to ensure that the CONTRACTOR modifies or incorporates necessary mitigation actions and monitoring plans to reflect on-site field conditions.
- The cost of mitigation measures and monitoring activities will be part of the contract of the project and it will be paid by the contractor.

Operational and Maintenance Phase

Mitigations measures in the ESMP that are beyond the construction phase are not within the scope of the CONTRACTOR's work; it is the responsibility of the responsible person at each household/staff at each school. In addition, the monitoring activities will be taken by PENRA/EQA. The operational phase includes all O&M activities, which begin as soon as the project is handed to the project owner.

7.3. Reporting

Compliance monitoring will be conducted, using the specific measures relevant to, and prescribed for the activities. The monitoring will also assess the general environmental and social performance. Monitoring report should contain information with regard to environmental and social compliance as well as any difficulty or outstanding works need to be prepared using an environmental and social compliance checklist (See Annex 7).

During construction phase, the contractor will be responsible for submitting a daily report to the supervision engineers at PENRA, the report should include number and type of complaints and how they were resolved in addition to the GRM log, any accidents resulting chemical leakage and how they have been resolved, how and when the facilities administration are informed of any electricity interruptions, and when the public were informed of work schedules and management plans. The contractor will also be required to report on the management of labor, and occupational health and safety issues which will be reviewed by the supervision engineer at PENRA as well as the workers' grievances.

The supervision engineers at PENRA in turn will be responsible for submitting a weekly monitoring report to the Project Management Unit of PENRA, who will report to the Bank to notify it of the main findings. While during operation, PENRA-PMU in coordination with EQA will be responsible for the preparation of monthly reports for their records; to be shared with the WB.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
Construction Phase					
Environmental Impacts					
Air Quality • Minor impact due to vehicle movements.	• Plan vehicle movements and do not overload vehicles to minimize exhaust emissions. • Assure the use of well-maintained mechanical construction equipment.	• Contractor	• Document complaints relevant to air quality issues and how they were resolved.	• Monitoring – CONTRACTOR Oversight – SUPERVISION ENGINEER, PENRA and EQA	Daily – Work activities.
Noise Quality • Nuisance on students at schools, workers and local residents due to noise generating activities associated with operation of machinery, transport of materials in trucks, and installation of mounting structures and PV modules	• Comply with Palestinian Labor Law regarding provision of protective hearing devices and appropriate safety equipment to workers on construction sites, where construction works are expected to produce noise over an appropriate level. • Apply OSHA 1910.95 (a) and OSHA 1910.95 (b) regarding exposure periods to different noise levels. • Provide well-maintained construction vehicles and machinery, in order to minimize noise. • Prohibit operating heavy or noisy machinery between the hours of 8:00 pm (20.00) and 6:00 am during working days and all day during Fridays or designated local holidays (unless the public will be best served during these hours	• Contractor	• Document noise concerns • Document complaints and how they were resolved.	• Monitoring – CONTRACTOR • Oversight – ENGINEER, PENRA and EQA	Daily – Work activities.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	and approval has been provided by local government, school administration and surrounding residents). • Schedule working hours and work days taking into consideration working time at the schools for both shifts, to avoid using heavy machinery during school hours (downloading of PV panels and steel structures and uploading them to the roofs of the schools should take place after 03:30 pm).				
Hazardous Materials and Waste • The hazardous materials during construction are limited to chemicals from accidental damage or spillage of PV cells and/or batteries, such as lead, cadmium, and acids.	• Identify suppliers for different components of the PV system (PV panels, inverters and batteries) of ISO-or best industry standard- compliant products, • Provide all necessary PPEs for handling hazardous material depending on type and status of material. • Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous Waste Management Plan attached in Annex 6.	• Contractor	• Record and document any accidents resulting chemical leakage and how they have been resolved	• Monitoring – CONTRACTOR • Oversight – SUPERVISION ENGINEER, PENRA and EQA	Daily – Work activities.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
Non-hazardous Waste Management and Disposal • Impacts on land use and visual appearance.	• Identify expected types and volumes of waste, how it will be stored, if required, and when and where it will be disposed of, where disposal should be done at a recognized landfill. • Apply good housekeeping practices at all times in all project sites, including approved designated and protected areas for temporary waste storage, if required . • Prohibit stockpiling of materials or generated construction waste on private areas, except as approved by the landowner .	• Contractor	• Record all waste materials and indicate if it is to be reused or disposed. • Maintain log of all disposed items and location of disposal. • Maintain log of all reused or recycled items, amount, and location used.	• Monitoring – CONTRACTOR • Oversight – SUPERVISION ENGINEER, PENRA	Daily – Work activities.
Socio-economic Impacts					
Energy Supply • Limited to temporary interruptions in electricity services during reallocation of electrical connections to accommodate the new system.	• Work efficiently and within an expedited schedule for implementation of connections reallocation.	• Contractor	• Document how, and when the administration/household is informed of any electricity interruptions.	• Oversight – SUPERVISION ENGINEER, PENRA	Daily – Work activities.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
Public and Occupational Health and Safety • Physical hazards from falling and injuries, risks from movement of heavy machinery, and physical hazards from contact with hazardous material. • Potential risk of SEA/SH on school female students and teachers • COVID-19 infection given that the construction works will take place during this pandemic • Potential labor management risks (child and forced labor, labor influx,	• The contractor shall Prepare, submit and implement health and safety plan (OHS) for PENRA approval prior to starting any project activities. • The contractor shall prepare an Emergency Response Plan (ERP) in coordination with the relevant local authorities. The ERP should include clear procedures for evacuation, severe weather, lockdown, medical emergency, fire emergency, hazardous materials management, and working-during-pandemic; the ERP should also include information about the public emergency services. • Comply with the provisions of labor law and the World Bank guidelines on the mitigation of Sexual Exploitation and Abuse such as the signing of enforceable workers' codes of conduct. • Code of Conduct shall be written in local language; Codes of Conducts and provisions related to SEA/SH shall be incorporated into the bidding documents.	• Contractor	• Record when the public was informed of work schedules and management plans • Conduct periodical site inspections • Document and report potential health and safety concerns and their resolution • Record and document any accidents and how they have been resolved • Conduct site visits and document that workers are properly wearing their PPE • Record and document any grievances and how they have been resolved • Review relevant documents to ensure that codes of conduct are being signed as required and that workers are aware of the requirements and have received any requisite training or briefing in this regard.	• Monitoring – CONTRACTOR • Oversight – SUPERVISION ENGINEER, PENRA	Daily – Work activities. e

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
workers' insurance, workers health & safety)	• The project's level GM will include specific procedures for SEA/SH including confidential reporting and ethical documentation of GBV cases. • Comply with the Secondary Legislations associated with the Palestinian Labor Law, particularly the Ministerial Cabinet Order No.49, Year 2004 about protection measures from work risks and illnesses and Guidelines No.1, year 2005 on provision of precautionary measures to protect workers at construction sites. • Comply with the Palestinian Child Law article 14 and the International labor Organization (ILO) agreement, where the child of age under 18 years will not be employed or engaged in the project. • All workers shall be insured by the contractor for any potential work accidents and injuries according to the Palestinian Labor Law . • Provide adequate personal protective equipment (PPE) including hard hats, safety				

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	goggles, and other appropriate safety equipment to protect workers from injury. • Respect all safety measures required for working on rooftops. Apply the OSHA roofing works measures (OSHA 29 CFR 1926.502 (j) (7)) during the installation of roof-top PV systems. • Schedule working hours and work days taking into consideration working time at the schools for both shifts, where no construction activities should take place during school hours (downloading of PV panels and steel structures and uploading them to the roofs of the schools should take place after 03:30 pm). • Consider suitable engineering and occupational health and safety practices during site preparation in areas where unprotected electrical cables and unstable objects are stored and exist. Keep a careful watch for cables during construction; do not use handheld power tools within close distance of any				

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	electricity cable unless the cable is safely covered, and keep walkways and stairways free of unstable objects and wastes. • For all installation activities at Hatem Atta'i school, and when working near the roof edge in other sites, additional safety measures should be considered to enhance workers safety; a roofer's kit should be used, the kit is to be installed and maintained consistent with the manufacturer's instructions. • Contractor will hire local workers to minimize labor influx. • Ensure workers' access to clean water and sanitation services, which could be provided in coordination with the schools administration at schools and with HHs owners at HHs, given the very short period of implementation, where the provision of a separate source of water and sanitation services will not be feasible. • Mechanisms for communicating grievances shall be made available for all workers. •				

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	Specific measure for COVID-19 infection control, where Contractor should commit to the Ministry of Health/WHO guidelines regarding Covid-19 including but not limited to: • Ensure frequent, sustained hand washing and use of hand sanitizers. All of the installations crews should refrain from shaking hands or other close-proximity interactions. • Disinfect frequently touched surfaces on the work site after installation such as the electrical panel, ladders, and solar equipment. • The number of installers should be reduced in order to practice social distancing.				
Element and Impact	**Mitigation Measures**	**Execution Responsibility**	**Monitoring Activity**	**Monitoring Responsibility**	**Monitoring Frequency**
Operation and Maintenance Phase					
Environmental Impacts					
Hazardous Materials and Waste • Hazardous materials resulted from the end-of-life disposal of PV	• Dispose packaging and construction waste (used during maintenance activities) at approved waste management sites using registered transport services.	• Responsible person at each household/school	• Conduct periodic inspections of waste storage areas and document the status of stored materials,	• PENRA/EQA	As needed– During operation/dismantling

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
panels and storage batteries, such as lead, cadmium, and acids present in PV panels manufacture and storage batteries. • Waste of electrical appliances, and scrap metals	• Provide a temporary storage facility to contain disposed solar panels ahead of final disposal to EQA approved facility. • Contract with recycling workshops/facilities capable of handling battery waste. • Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous Waste Management Plan attached in Annex 6.		• Create and periodically check a hazardous waste record keeping		
Socio-economic Impacts					
Public and Occupational Health and Safety • Risk on health during the maintenance of PV modules and related inverters and other electrical devices (i.e. electric shocks). • Physical hazards from falling and injuries due to	• Training of the systems operators at schools and system owners at each household on the basic instructions for the operation of the system and related inverters and other electrical devices. • Works on electrical instrumentation and protective equipment must be carried out only by a qualified engineer and technician/s. School staff/household owner is not allowed to continue with maintenance unless the functional state of protective equipment is ensured.	• Responsible person at each household/school	• Inspect and test all safety features and measures focusing on personal protective features and tools used. • document any accidents and how they have been resolved • Ensure, through field inspection and direct communication with the system operators at HHs and schools, that they are aware of basic O&M requirements and that	• PENRA	Monthly – During operation/dismantling.

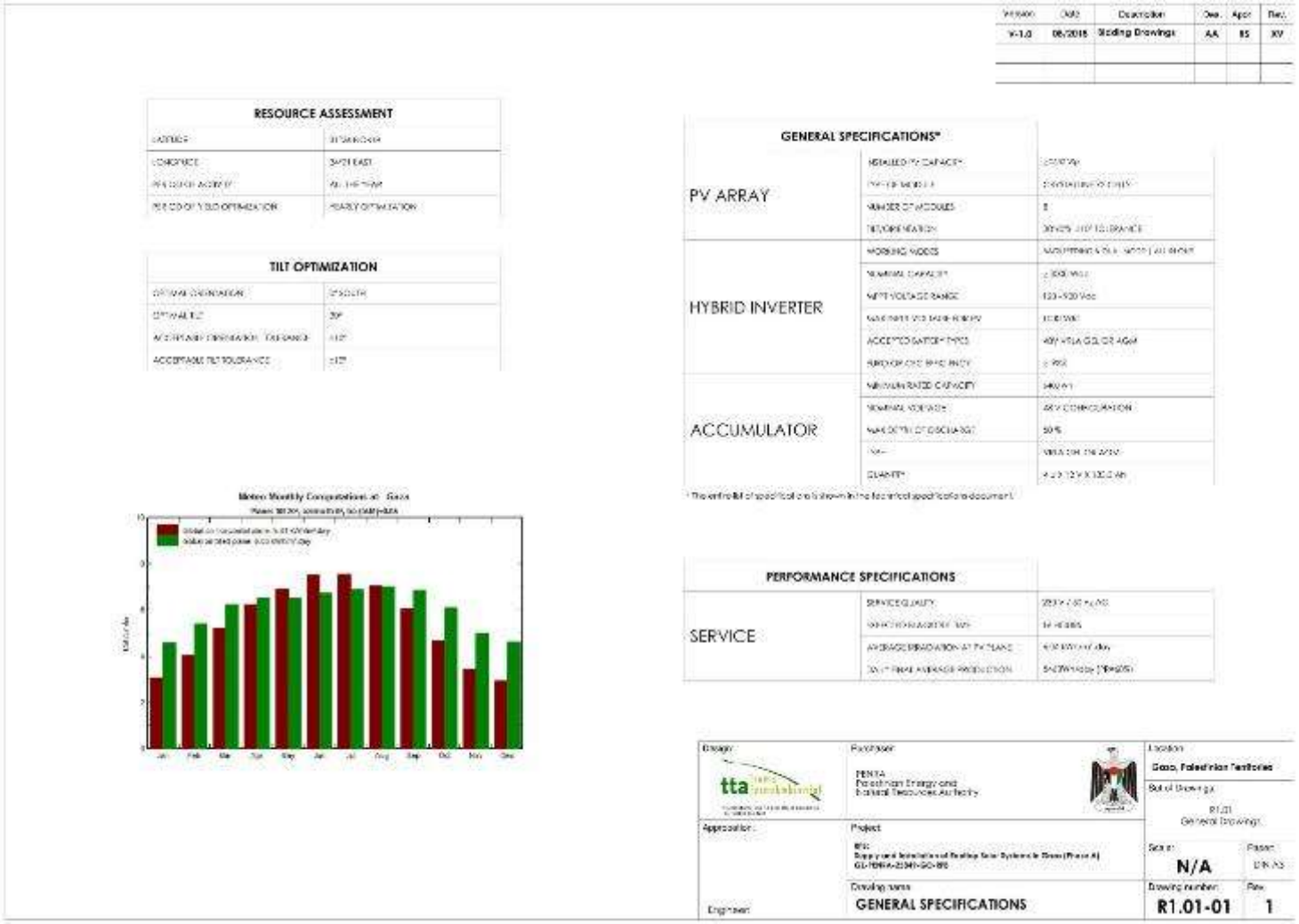
Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
mechanical reconstruction works.	• Power supply connections and breakers should be kept secure against unexpected restart and a warning label must be attached against restarting. • The system control room/cabinet must contain all safety measures such as firefighters, free of flammable materials, natural and artificial ventilation, and under the eyes of guards. • A drawing on the control room/cabinet shall provide warning about safety hazards, e.g. smoking, acid handling, as well as emergency shutdown procedures, etc.		they have received the training in this regard.		

References

- Abd Rabou, A., 2009. On the occurrence of some carnivores in the Gaza Strip, Palestine (Mammalia: Carnivora). Zoology in the Middle East, 46: 109-112.
- Al Madhoun, W.A., Mokat, R.M., Hein, Z.A. and Isahak, M., 2016. Assessment of Carbon Dioxide Emissions from Traffic and Its Health Impact in Gaza, Palestine. Public Health Research 2016, 6(1): 18-23.
- Al Madhoun, W., Hararah, S., Ramli A. N., Mahmoud, R. & Shalaby, L., 2013. Monitoring and Modelling of Traffic Noise at Several Sites in Gaza City. 10.13140/2.1.5009.3127.
- EPRI, 2006. Transboundary Air Quality Effects from Urbanization, Gaza, Palestine.
- OCHA, 2018. Education undermined by deteriorating humanitarian situation in Gaza. [online] Available at: https://www.ochaopt.org/content/education-undermined-deteriorating-humanitarian-situation-gaza [Accessed 24 March 2021].
- PCBS, 2018. Preliminary Census Results, Population, Housing, and Establishments (Census, 2017). Ramallah, Palestine.
- UN, 2017. Gaza Ten Years Later, United Nations Country Team in the occupied Palestinian territory.

Annex 1: Initial Design and general layout and specifications of the proposed PV systems



Version	Date	Description	Des.	Appr.	Rev.
V-1.0	08/2018	Bidding Drawings	AA	BS	XY

RESOURCE ASSESSMENT

LATITUDE	[illegible]
LONGITUDE	[illegible] EAST
[illegible]	[illegible]
[illegible]	[illegible]

TILT OPTIMIZATION

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

GENERAL SPECIFICATIONS*

PV ARRAY	[illegible]	[illegible]
	[illegible]	[illegible]
	NUMBER OF MODULES	[illegible]
	[illegible]	[illegible]
HYBRID INVERTER	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
ACCUMULATOR	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]

* The entire list of specifications is shown in the technical specifications document.

PERFORMANCE SPECIFICATIONS

SERVICE	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]

Energy: tta

Purchaser: PENRA Palestinian Energy and Natural Resources Authority

Location: Gaza, Palestinian Territories

Set of Drawings: R1.01 General Drawings

Approved by:

Project: [illegible]

Scale: N/A

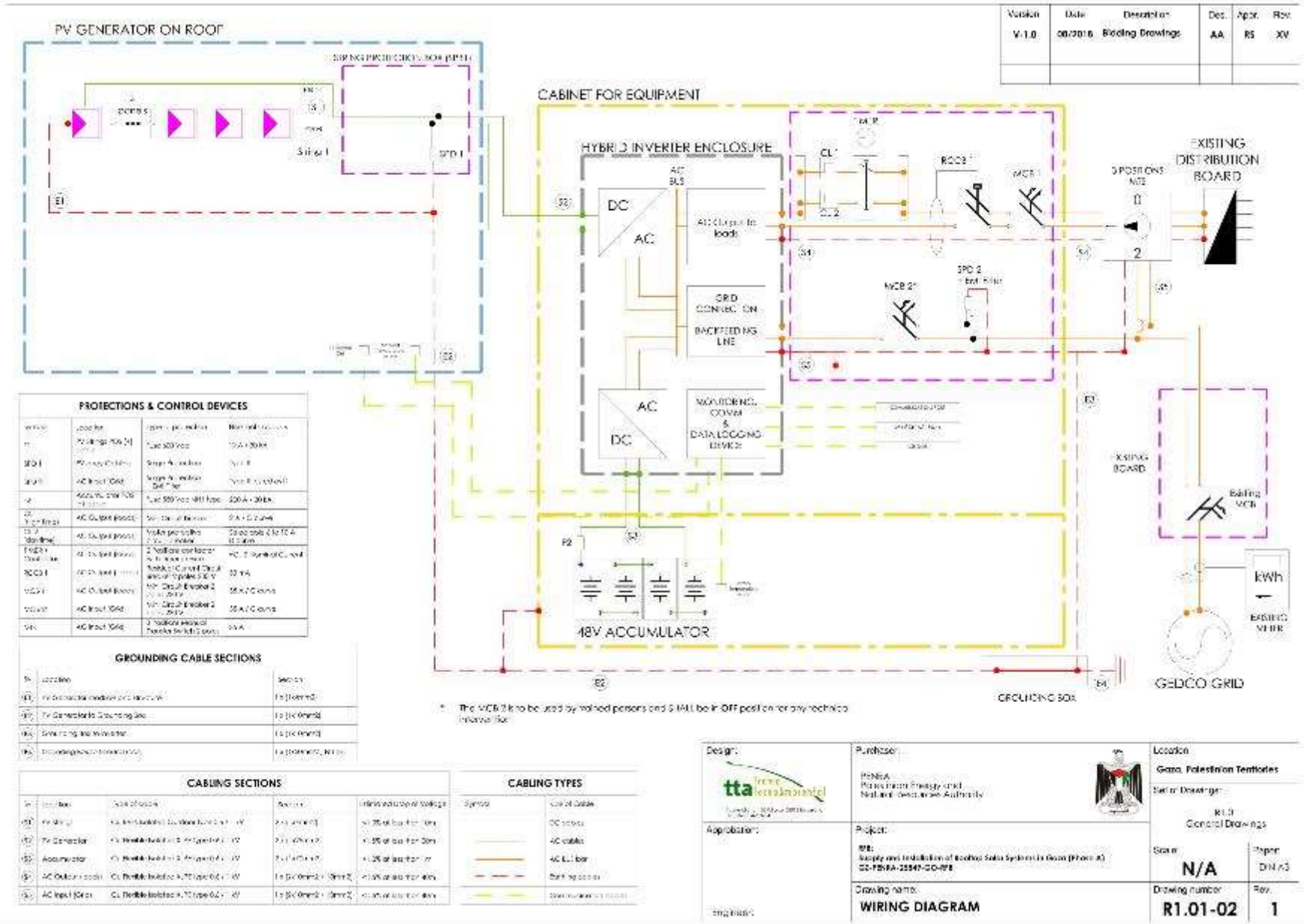
Paper: [illegible]

Drawing name: GENERAL SPECIFICATIONS

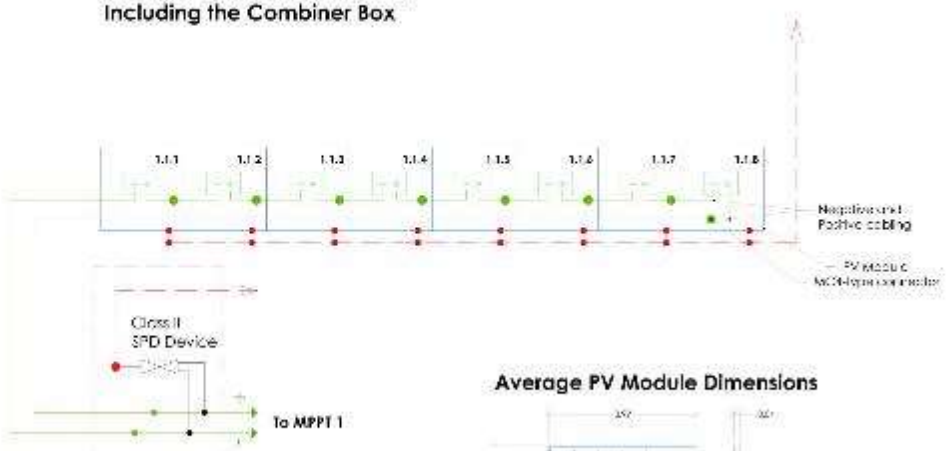
Drawing number: R1.01-01

Rev: 1

Engineer:


PV GENERATOR ON ROOF
CABINET FOR EQUIPMENT
HYBRID INVERTER ENCLOSURE
EXISTING DISTRIBUTION BOARD
48V ACCUMULATOR
GEDCO GRID
GROUNDING BOX
PROTECTIONS & CONTROL DEVICES
GROUNDING CABLE SECTIONS
CABLING SECTIONS
CABLING TYPES
Design:
Purchaser:
Location
Gaza, Palestinian Territories
Approbation:
Project:
Drawing name:
WIRING DIAGRAM
Drawing number
R1.01-02
Rev.
1
Scale
N/A
Paper
DIN A3

Cabling diagram for PV Arrays Including the Combiner Box



String Protection Box (SPB1)
One PV String with eight PV modules in series

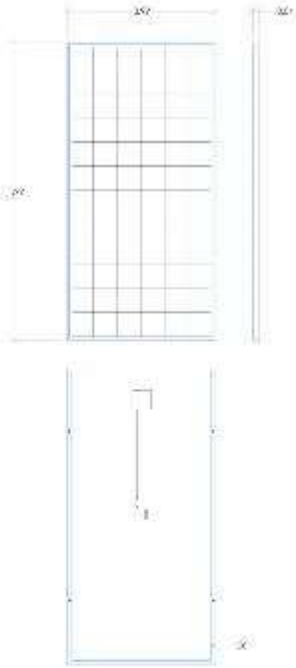
CONFIGURATION	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

MODULES AT STC*	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

*Average specifications under Standard Testing Conditions of 1000 W/m², cell temperature: 25°C and air mass of 1.5 in accordance with EN 61215 2).

PV GENERATOR AT STC	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Average PV Module Dimensions

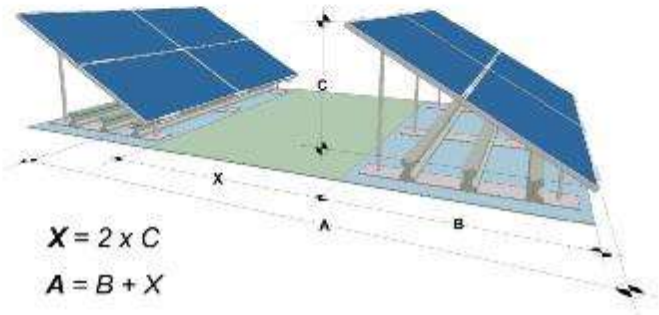


Version	Date	Description	Des.	Appr.	Rev.
V-1.0	08/2016	Bidding Drawings	AA	RS	XV

Mounting Structure

The PV generator needs to be installed in multiple arrays due to characteristics of the roof. It is necessary to keep enough distance between sheds to keep the modules free of shade. This distance, called Pitch, must be at least two times the height of the fixed collector plane plus the horizontal dimension.

A: Pitch (Nominal distance between sheds)
B: Horizontal length of a PV Shed
C: Height of a PV Shed
X: Horizontal distance between PV sheds



$X = 2 \times C$

$A = B + X$

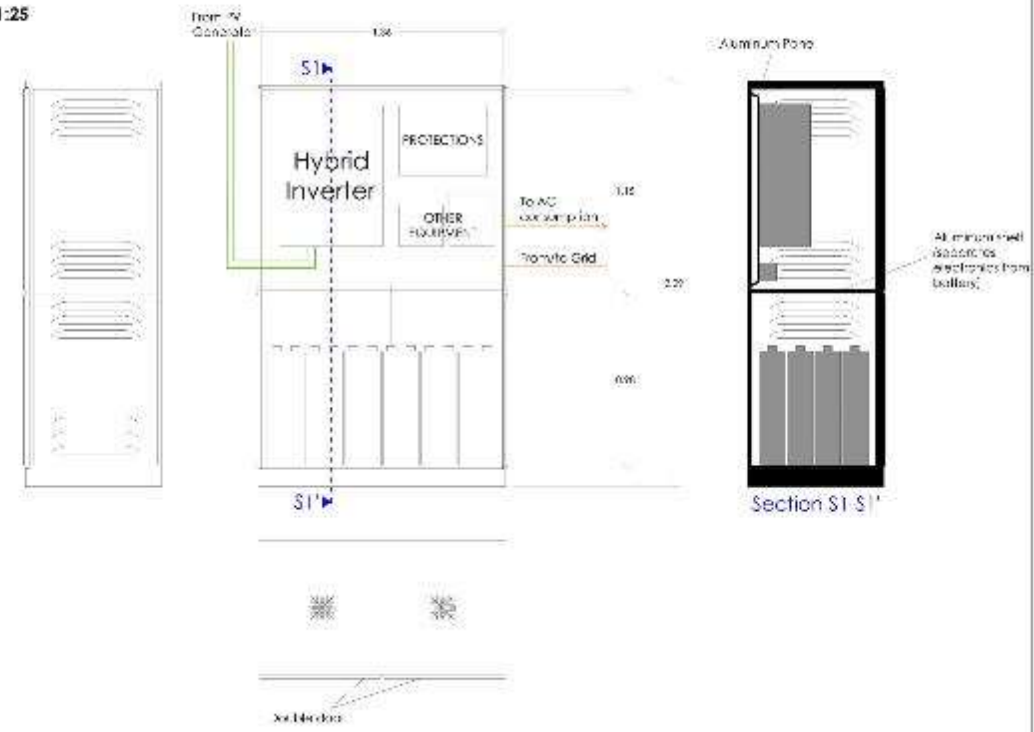
SUPPORT STRUCTURES	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Design: tta Terra Technologies	Purchaser: PENRA Palestinian Energy and Natural Resources Authority	Location: Gaza, Palestinian Territories	
Approbation:	Project: PPR: Supply and Installation of Rooftop Solar Systems in Gaza (Phase A) GS-PENRA-25547-GO-RFB	Set of Drawings: R1.0 General Drawings	
		Scale: N/A	Paper: DIN A3
Engineer:	Drawing name: SPECIFICATIONS OF PV GENERATOR	Drawing number: R1.01-03	Rev.: 1

Version	Date	Description	Des.	Appr.	Rev.
V-1.0	08/2016	Bidding Drawings	AA	RS	XV

Cabinet for equipment

1:25

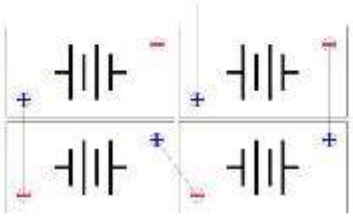


Battery Specifications
1:10

ACCUMULATOR

- High Quality Valve Regulated Lead Acid (VLRA) deep cycle for solar applications
- 6 or 12V elements (Never a combination of both). GEL or AGM type
- Ampere-Hour capacity (Ah) at C20 @ 25°C discharge rate conditions tested below IEC 60896 or IEC 61427
- 1200 cycles or higher at 50% DOD tested under IEC 61427
- Battery Fuse shall be as near as possible to the battery, in all cases at the upper part of the cabinet.

BATTERY VOLTAGE	48 V
NUMBER OF ELEMENTS IN SERIES	8 (6V elements) or 4 (12 V elements)
MINIMUM NOMINAL CAPACITY	133.3 Ah (6,4 kWh) at C20 @ 25°C
USEFUL CAPACITY (50% DOD)	3,0 kWh at C20 @ 25°C
Standards and Certifications of the battery elements	Compliant with IEC 61427, IEC 60896-21, IEC 60896-22, CE, OHSAS 18001:2007, ISO 14001:2014 and ISO 9001:2008



Example of configuration for the Accumulator

GENERAL REMARKS

The cabinet shall be installed in an accessible area near the main distribution board of the building.

The cabinet shall be:

- Protected by a lock
- Installed inside a building protected from water and dust.
- Located in a place without condensation.

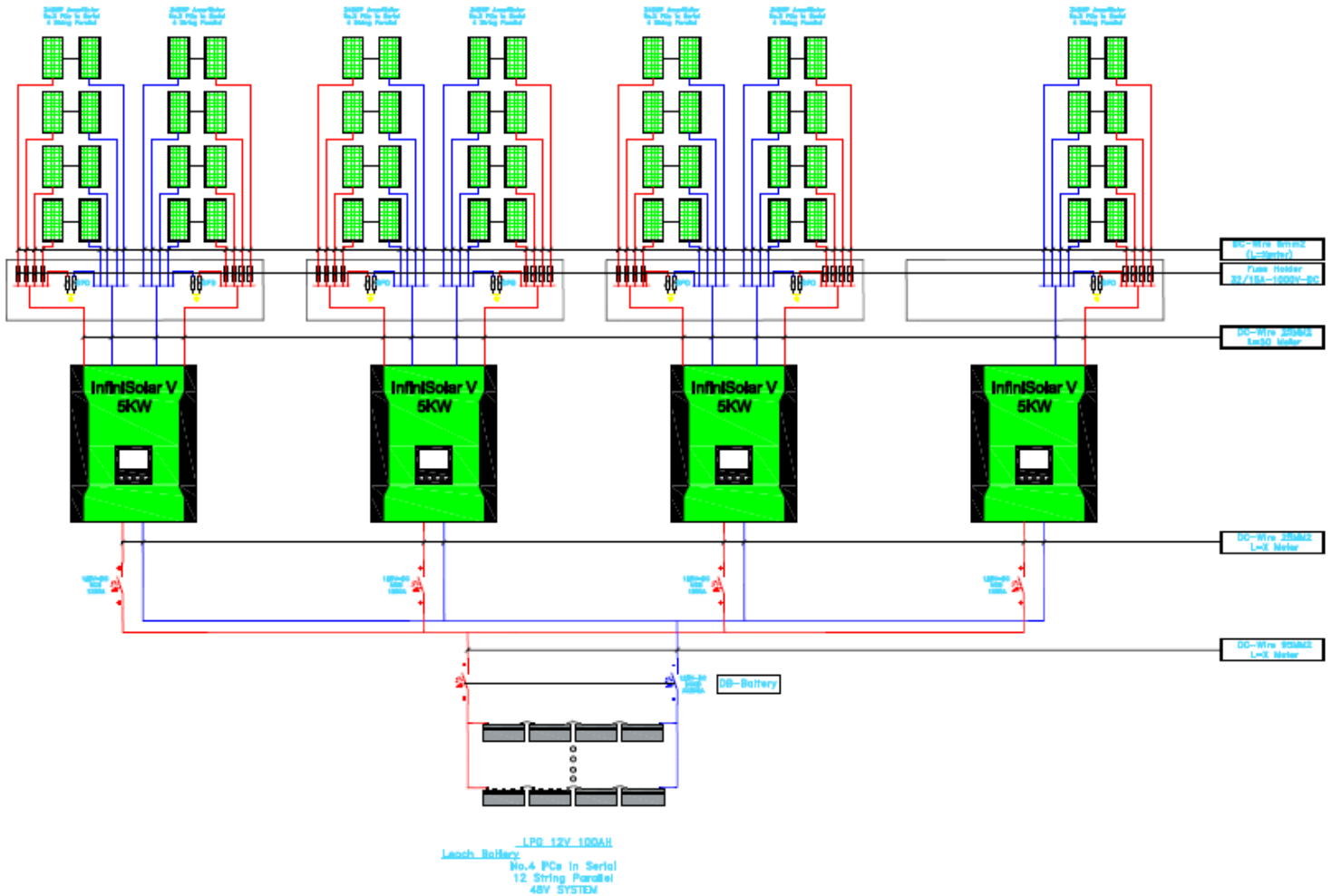
The cabinet shall have two compartments with separated ventilation to hold:

- The battery and the temperature sensor in the lower compartment
- The hybrid inverter, the protections and communication devices in the upper compartment.

- All the dimensions given are orientative and shall be adjusted by the bidder according to manufacturer installation requirements.

- Ventilation openings

Design: tta	Purchaser: PENRA Palestinian Energy and Natural Resources Authority	Location: **Gaza, Palestinian Territories**
Approbation:	Project: RFB: Supply and Installation of Rooftop Solar Systems in Gaza (Phase A) GZ-PENRA-25547-GO-RFB	Set of Drawings: R1.0 General Drawings
		Scale: 1:25 & 1:10 — Paper: DIN A3
Engineer:	Drawing name: **SPECIFICATIONS OF CABINET AND BATTERY**	Drawing number: **R1.01-04** — Rev.: 1



Recommended Layout for the Solar system

with 4 inverters and 56 solar panels

Annex 2: Photos for sub-projects Sites

Proposed site for PV installations at Sumaya Bint Kheyat School

Western border of the proposed site for PV installations at Sumaya Bint Kheyat School (Ain Jalout School)

Eastern border of the proposed site for PV installations at Sumaya Bint Kheyat School

Northern border of the proposed site for PV installations at Sumaya Bint Kheyat School

Proposed site for PV installations at Al Farabi School

Western border of the proposed site for PV installations at Al Farabi School

Eastern border of the proposed site for PV installations at Al Farabi School

Southern border of the proposed site for PV installations at Al Farabi School

Proposed site for PV installations at Al Rafi'i School

Southern border of the proposed site for PV installations at Al Rafi'i School

Western border of the proposed site for PV installations at Al Rafi'i School

Eastern border of the proposed site for PV installations at Al Rafi'i School

Northern border of the proposed site for PV installations at Al Rafi'i School (Al Naqab Primary School)

Proposed site for PV installations at Ashaymaa School (The MoEHE will remove this system to allow for the proposed system installation)

Eastern border of the proposed site for PV installations at Ashaymaa School

Southern border of the proposed site for PV installations at Ashaymaa School

Western border of the proposed site for PV installations at Ashaymaa School

Northern border of the proposed site for PV installations at Ashaymaa School

Proposed site for PV installations at Deir Al Balah School and its northern border

Southern border of the proposed site for PV installations at Deir Al Balah School

Eastern border of the proposed site for PV installations at Deir Al Balah School

Proposed site for PV installations at Hatem Atta'i School

Southern border of the proposed site for PV installations at Hatem Atta'i School

Northern border of the proposed site for PV installations at Hatem Atta'i School

Western border of the proposed site for PV installations at Hatem Atta'i School

Proposed site for PV installations at Oqba bin Nafe' School

Southern border of the proposed site for PV installations at Oqba bin Nafe' School

Western border of the proposed site for PV installations at Oqba bin Nafe' School

Eastern border of the proposed site for PV installations at Oqba bin Nafe' School

Proposed site for PV installations at HH1 and its northern border

Eastern border of the proposed site for PV installations at HH1

Western border of the proposed site for PV installations at HH1

Sothern border of the proposed site for PV installations at HH1

Proposed site for PV installations at HH2

Western border of the proposed site for PV installations at HH2

Southern border of the proposed site for PV installations at HH2

Eastern border of the proposed site for PV installations at HH2

Proposed site for PV installations at HH3 and its western border

Southern border of the proposed site for PV installations at HH3

Northern border of the proposed site for PV installations at HH3

Eastern border of the proposed site for PV installations at HH3

Proposed site for PV installations at HH4 and its eastern and southern borders

Proposed site for PV installations at HH5 (The bed and the steel cover will be removed to create enough shade-free area for the installation of the system)

Southern border of the proposed site for PV installations at HH5

Northern border of the proposed site for PV installations at HH5

Eastern border of the proposed site for PV installations at HH5

Western border of the proposed site for PV installations at HH5

Annex 3: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings

With the outbreak and spread of COVID-19, people have been advised, or may be mandated by national or local law, to exercise social distancing, and specifically to avoid public gatherings to prevent and reduce the risk of the virus transmission. Countries have taken various restrictive measures, some imposing strict restrictions on public gatherings, meetings and people's movement, and others advising against public group events. At the same time, the general public has become increasingly aware and concerned about the risks of transmission, particularly through social interactions at large gatherings.

These restrictions have implications for World Bank-supported operations. In particular, they will affect Bank requirements for public consultation and stakeholder engagement in projects, both under implementation and preparation. WHO has issued technical guidance in dealing with COVID-19, including: (i) **Risk Communication and Community Engagement (RCCE) Action Plan Guidance Preparedness and Response; (ii)** Risk Communication and Community engagement (RCCE) readiness and response; (iii) COVID-19 risk communication package for healthcare facilities; (iv) Getting your workplace ready for COVID-19; and (v) a guide to preventing and addressing social stigma associated with COVID-19. All these documents are available on the WHO website through the following link: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance.

This Note offers suggestions to World Bank task teams for advising counterpart agencies on managing public consultation and stakeholder engagement in their projects, with the recognition that the situation is developing rapidly and careful regard needs to be given to national requirements and any updated guidance issued by WHO. It is important that the alternative ways of managing consultation and stakeholder engagement discussed with clients are in accordance with the local applicable laws and policies, especially those related to media and communication. The suggestions set out below are subject to confirmation that they are in accordance with existing laws and regulations applying to the project.

Investment projects under implementation. All projects under implementation are likely to have public consultation and stakeholder engagement activities planned and committed as part of project design. These activities may be described in different project documents, and will involve a variety of stakeholders. Commonly planned avenues of such engagement are public hearings, community meetings, focus group discussions, field surveys and individual interviews. With growing concern about the risk of virus spread, there is an urgent need to adjust the approach and methodology for continuing stakeholder consultation and engagement. Taking into account the importance of confirming compliance with national law requirements, below are some suggestions for task teams' consideration while advising their clients:

Task teams will need to review their project, jointly with the PMUs, and should:

- Identify and review planned activities under the project requiring stakeholder engagement and public consultations.

- Assess the level of proposed direct engagement with stakeholders, including location and size of proposed gatherings, frequency of engagement, categories of stakeholders (international, national, local) etc.
- Assess the level of risks of the virus transmission for these engagements, and how restrictions that are in effect in the country / project area would affect these engagements.
- Identify project activities for which consultation/engagement is critical and cannot be postponed without having significant impact on project timelines. For example, selection of resettlement options by affected people during project implementation. Reflecting the specific activity, consider viable means of achieving the necessary input from stakeholders (see further below).
- Assess the level of ICT penetration among key stakeholder groups, to identify the type of communication channels that can be effectively used in the project context.

Based on the above, task teams should discuss and agree with PMUs the specific channels of communication that should be used while conducting stakeholder consultation and engagement activities. The following are some considerations while selecting channels of communication, in light of the current COVID-19 situation:

- Avoid public gatherings (taking into account national restrictions), including public hearings, workshops and community meetings;
- If smaller meetings are permitted, conduct consultations in small-group sessions, such as focus group meetings If not permitted, make all reasonable efforts to conduct meetings through online channels, including webex, zoom and skype;
- Diversify means of communication and rely more on social media and online channels. Where possible and appropriate, create dedicated online platforms and chatgroups appropriate for the purpose, based on the type and category of stakeholders;
- Employ traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, and mail) when stakeholders to do not have access to online channels or do not use them frequently. Traditional channels can also be highly effective in conveying relevant information to stakeholders, and allow them to provide their feedback and suggestions;
- Where direct engagement with project affected people or beneficiaries is necessary, such as would be the case for Resettlement Action Plans or Indigenous Peoples Plans preparation and implementation, identify channels for direct communication with each affected household via a context specific combination of email messages, mail, online platforms, dedicated phone lines with knowledgeable operators;
- Each of the proposed channels of engagement should clearly specify how feedback and suggestions can be provided by stakeholders;
- An appropriate approach to conducting stakeholder engagement can be developed in most contexts and situations. However, in situations where none of the above means of communication are considered adequate for required consultations with stakeholders, the team should discuss with the PMU whether the project activity can be rescheduled to a later time, when meaningful stakeholder engagement is possible. Where it is not possible to postpone the activity (such as in the case of ongoing resettlement) or where the postponement is likely to be for more than a few weeks, the task team should consult with the OESRC to obtain advice and guidance.

Investment projects under preparation. Where projects are under preparation and stakeholder engagement is about to commence or is ongoing, such as in the project E&S

planning process, stakeholder consultation and engagement activities should not be deferred, but rather designed to be fit for purpose to ensure effective and meaningful consultations to meet project and stakeholder needs. Some suggestions for advising clients on stakeholder engagement in such situations are given below. These suggestions are subject to the coronavirus situation in country, and restrictions put in place by governments. The task team and the PMU should:

- Review the country COVID-19 spread situation in the project area, and the restrictions put in place by the government to contain virus spread;
- Review the draft Stakeholder Engagement Plan (SEP, if it exists) or other agreed stakeholder engagement arrangements, particularly the approach, methods and forms of engagement proposed, and assess the associated potential risks of virus transmission in conducting various engagement activities;
- Be sure that all task team and PIU members articulate and express their understandings on social behavior and good hygiene practices, and that any stakeholder engagement events be preceded with the procedure of articulating such hygienic practices.
- Avoid public gatherings (taking into account national restrictions), including public hearings, workshops and community meetings, and minimize direct interaction between project agencies and beneficiaries / affected people;
- If smaller meetings are permitted, conduct consultations in small-group sessions, such as focus group meetings. If not permitted, make all reasonable efforts to conduct meetings through online channels, including webex, zoom and skype meetings;
- Diversify means of communication and rely more on social media and online channels. Where possible and appropriate, create dedicated online platforms and chatgroups appropriate for the purpose, based on the type and category of stakeholders;
- Employ traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Such channels can also be highly effective in conveying relevant information to stakeholders, and allow them to provide their feedback and suggestions;
- Employ online communication tools to design virtual workshops in situations where large meetings and workshops are essential, given the preparatory stage of the project. Webex, Skype, and in low ICT capacity situations, audio meetings, can be effective tools to design virtual workshops. The format of such workshops could include the following steps:
    - *Virtual registration of participants*: Participants can register online through a dedicated platform.
    - *Distribution of workshop materials to participants, including agenda, project documents, presentations, questionnaires and discussion topics*: These can be distributed online to participants.
    - *Review of distributed information materials*: Participants are given a scheduled duration for this, prior to scheduling a discussion on the information provided.
    - *Discussion, feedback collection and sharing*:
        - ✓ Participants can be organized and assigned to different topic groups, teams or virtual “tables” provided they agree to this.
        - ✓ Group, team and table discussions can be organized through social media means, such as webex, skype or zoom, or through written feedback in the

form of an electronic questionnaire or feedback forms that can be emailed back.

- *Conclusion and summary:* The chair of the workshop will summarize the virtual workshop discussion, formulate conclusions and share electronically with all participants.

- In situations where online interaction is challenging, information can be disseminated through digital platform (where available) like Facebook, Twitter, WhatsApp groups, Project weblinks/ websites, and traditional means of communications (TV, newspaper, radio, phone calls and mails with clear description of mechanisms for providing feedback via mail and / or dedicated telephone lines. All channels of communication need to clearly specify how stakeholders can provide their feedback and suggestions.
- *Engagement with direct stakeholders for household surveys*: There may be planning activities that require direct stakeholder engagement, particularly in the field. One example is resettlement planning where surveys need to be conducted to ascertain socioeconomic status of affected people, take inventory of their affected assets, and facilitate discussions related to relocation and livelihood planning. Such survey activities require active participation of local stakeholders, particularly the potentially adversely affected communities. However, there may be situations involving indigenous communities, or other communities that may not have access to the digital platforms or means of communication, teams should develop specially tailored stakeholder engagement approaches that will be appropriate in the specific setting. The teams should reach out to the regional PMs for ENB and Social Development or to the ESSA for the respective region, in case they need additional support to develop such tailored approaches.
- In situations where it is determined that meaningful consultations that are critical to the conduct of a specific project activity cannot be conducted in spite of all reasonable efforts on the part of the client supported by the Bank, the task team should discuss with the client whether the proposed project activities can be postponed by a few weeks in view of the virus spread risks. This would depend on the COVID-19 situation in the country, and the government policy requirements to contain the virus spread. Where it is not possible to postpone the activity (such as in the case of ongoing resettlement) or where the postponement is likely to be for more than a few weeks, the task team should consult with the OESRC to obtain advice and guidance.

Annex 4: Photos during Individual Meetings

Meeting with the principal of Sumaya Bint Kheyat Primary School

Meeting with the principal of Al Farabi Primary School

Meeting with principal of Al Rafi'i Primary School

Meeting with the principal of Ashaymaa Primary School

Meeting with the principal of Deir Al Balah Primary School

Meeting with principal of Hatem Atta'i Primary School

Meeting with the principal's assistant at Oqba bin Nafe' Primary School

Meeting with the owner of HH1

Meeting with the owner of HH2

Meeting with the owner of HH3

Meeting with the owner of HH4

Meeting with the owner of HH5

Meeting with neighbors of Al Sumaya bint Kheyat School (Principal of Ain Jalout School)

Meeting with one of the neighbors of Al Farabi School

Meeting neighbors of Al Farabi School (Principal of Al Moa'tasem Billah School)

Meeting with neighbors of Al Rafi'I School (Administrative staff at Al Naqab School)

Meeting with neighbors of Deir Al Balah Primary School

Meeting with neighbors of Hatem Atta'i School (Manager of the Civil Defense Center)

Meeting with neighbors of Oqba bin Nafe' School

Meeting with neighbors of Ashaymaa School (Manager of Ashaymaa Clinic)

Meeting with one of the neighbor of HH1

Meeting with another neighbor of HH1

Meeting with one of the neighbors of HH2

Meeting with another neighbor of HH2

Meeting with another neighbor of HH3

Meeting with another neighbor of HH3

Annex 5: Environmental and Social Screening of the sub-projects

Subproject Name: Sumaya Bint Kheyat Primary School
Name of neighborhood: Al Zaytoun Neighborhood – Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	x	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: Al Farabi Primary School
Name of neighborhood: Al Yarmouk Street – Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		x
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: Al Rafi'i Primary School
Name of neighborhood: Jabalia Downtown – Jabalia City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		X
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	x	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: Ashaymaa Primary School
Name of neighborhood: Ashaymaa neighborhood, Beit Lahia

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	x	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: Deir Al Balah Primary School
Name of neighborhood: Deir Al Balah City Center – Middle Governorate

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	x	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: Hatem Atta'I Primary school
Name of neighborhood: Al Bahar Street – Khan Younis City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	x	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: Oqba bin Nafe' Primary School
Name of neighborhood: Tel Al Sultan - Rafah

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	x	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH1
Name of neighborhood: West of Deir Al Balah City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X (None of the trees at the site will be trimmed or cut
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	x	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH2
Name of neighborhood: next to Al Mghazi Public Park- Al MAghazi

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X (None of the trees at the site will be trimmed or cut
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH3
Name of neighborhood: Al Naser Neighborhood – Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH4
Name of neighborhood: Al Naser Street – Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down/trim any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		x
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH5
Name of neighborhood: Sheikh Redwan neighborhood – Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?		x
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary building roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Annex 6: Hazardous Waste Management Plan

During the construction and operation phase, hazardous wastes might be produced. Table A5-1 presents the hazardous waste management plan that should be considered as a part of this ESMP. The plan consists of the potential source of hazardous waste, waste type, waste stream and the appropriate management actions of the waste. Moreover, the following sections discuss the required measures to be followed to ensure safe storage, collection, transportation, reuse/recycling and disposal.

Table A5-1: Hazardous Material Management Plan

Potential Source of waste	Waste Type	Waste Stream	Management Actions
Pre-construction Phase			
Potential accidental damage or spillage of PV cells and/or batteries.	Hazardous chemicals	Broken batteries/panels Lead, cadmium, and acids.	- Identify suppliers for different components of the PV system (PV panels, inverters and batteries) of ISO-or best industry standard- compliant products.
Construction Phase			
Accidental damage or spillage of PV cells and/or batteries.	Hazardous chemicals	Broken batteries/panels Lead, cadmium, and acids.	- Provide all necessary PPEs for handling hazardous material depending on type and status of material. - All workers should be familiar with hazardous waste warning signs. - Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully as discussed in the following sections.
Operation and Maintenance Phase			
End-of-life disposal of storage batteries and the solar panels when they fail to perform efficiently	Hazardous chemicals Waste of electrical appliances, and scrap metals	Broken batteries/panels Lead, cadmium, and acids.	- Dispose packaging and construction waste (used during maintenance activities) at approved waste management sites using registered transport services. - Provide a temporary storage facility to contain disposed solar panels ahead of final disposal to EQA approved facility. - Contract with recycling workshops/facilities capable of handling battery waste. - Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully

Potential Source of waste	Waste Type	Waste Stream	Management Actions
			as discussed in the following sections. - A hazardous waste record keeping should be created and checked by PENRA from time to time to make sure that hazardous waste is well managed.

Storage:

- Broken batteries/panels should be stored in separate containers. The containers should be labelled as “Hazardous waste”.
- Labelling system should be clear and well known to the public and workers to ensue general safety.

Collection and Transferring:

- Hazardous waste should be separated from hazardous waste. Collection of the hazardous waste container should be with special vehicle.
- A form should be filled by the generator and transporter, ahead of transportation, indicating the amount and type of hazardous waste.
- A written permission for transporting the hazardous waste to registered treatment/disposal facility should be issued by EQA.

Reuse/recycling:

- Some small workshops are currently repair old and broken batteries whenever possible; however, no improved battery recycling facilities are currently available in the Gaza Strip.
- Reuse and recycling facilities should be approved by EQA.
- During the recycling process, all safety measures should be applied for chemicals used during extraction and safe storage for the extracted heavy metals should be created.
- All waste generated from the battery recycling facility must be disposed of at the EQA-designated disposal site.
- All liquid waste must be stored in suitable containers for reuse or final disposal according to EQA regulation.
- The separated battery case should be washed, stored and can be used for manufacturing new battery casings.

Disposal:

- Existing technical facilities for treating and disposing of hazardous waste should be assigned before the start of the project.
- If the battery waste is not collected by the private sector, then it should be disposed in the hazardous waste-designated area in authorized landfills, which is currently available in Juhr Al Deek Landfill in Gaza City. Dismantled/broken PV panels should also be disposed of under guidance from the EQA in the hazardous waste-designated area in Juhr Al Deek Landfill.

Annex 7: Environmental and Social Compliance Checklist

Environmental and Social Compliance Checklist (Construction Phase)

	Project Name:					
	Sub-project site:					
	Location:					
	Date:					
#	**Impact to check**	**Yes**	**No**	**Remarks**	**Action taken**	**Action required**
1	Dust and emissions generation					
2	Noise generation					
3	Traffic problems (hindering, detours, closure …etc.)					
4	Timely coordination with schools, health facilities, shops and surrounding communities					
5	Trees removal/replantation/trimming					
6	Landscape/aesthetic element/s deteriorated					
7	Electricity services problems					
8	Interruption of water services					
9	Occupational Health and Safety plan in place					
10	Emergency response plan in place					
11	Accidents in the project site and the surrounding area					
12	Safety nets are used on roofs					
13	Appropriate warning signs are in place					
14	Adequate PPE is used by workers					
15	Working activities take place during schools break					
16	Accidents resulting chemical leakage					
17	Heritage and archaeological sites affected					
18	Other Impacts (Identify)					
Comments:						

Environmental and Social Compliance Checklist (Construction Phase)

	Project Name:					
	Sub-project site:					
	Location:					
	Date:					
#	**Impact to check**	**Yes**	**No**	**Remarks**	**Action taken**	**Action required**
Recommendations:						

Supervision Engineer **Signature:**

Date:

Environmental and Social Compliance Checklist (Operation and Maintenance Phase)

	Project Name:					
	Sub-project site:					
	Location:					
	Date:					
#	**Impact to check**	**Yes**	**No**	**Remarks**	**Action taken**	**Action required**
1	PPE continues to provide adequate protection and is being worn as required					
2	Accidents related to the project O&M activities					
3	Presence of loose connections and scorched cables					
4	The system control room/cabinet contains all safety measures					
5	Changes in the characteristics of the hazardous waste storage containers					
6	Changes in the quantity of materials in storage					
7	Breakages of panels or spills from storage batteries?					
8	Obstructions to easy access to the installed equipment?					
9	Storage batteries are adequately transferred to the recycling facilities/disposal sites					
10	Other Impacts (Identify)					
Comments:						
Recommendations:						

Environmental and Social Officer Signature: