Environmental and Social Impact Assessment (ESIA) and IMPACT ASSESSMENT (ESIA) & Environmental and Social Management Plan (ESMP) for Green Sharm El Sheikh Project (Waste Management Stream)

Final Report

Abbreviations

AQ	Air Quality
CTA	Chief Technical Adviser
Cl	chlorine
CLO	Community Liaison Officer
CITES	Convention on International Trade in Endangered Species
DOA	Delegation of Authority
DBO	Design/build/operate).
EGP	Egyptian Pound
ESIA/ESMP	Environmental and Social Impact Assessment/Environmental and Social Management Plan
ESMF	Environmental and Social Management Framework
ER	Executive Regulations
GIIP	Good International Industry Practice
GHG	Green House Gasses
GM	Grievance Mechanism
GRM	Grievance Redress Mechanism
HEPCA	Hurghada Environmental Protection and Conservation Association
KPI	Key Performance Indicators
MBT	Mechanical Biological Treatment
mn	million
MSW	Municipal Solid Waste
NCHR	National Council for Human Rights
NGOs	Non-Governmental Organization
OSH	Occupational Safety and Health
PC	Project Coordinator
PMU	Project Management Unit
SUPs	Single-use plastic
SES	Social and Environmental Standards
SCA	Supreme Council of Antiquities
EEAA	The Egyptian Environmental Affairs Agency
ILO	The International Labour Organization
TOC	total organic carbon
TEQ	toxic equivalents
UNDP-GEF	United Nations Development Program – Global Environmental Facility
UPOPS	Unintentional Persistent Organic Pollutants

WMRA	Waste Management Regulatory Authority
ETFEHA	

Symbols

C:N	Carbon: nitrogen
CH4	Methane
CO2	Carbon Dioxide
COD	chemical oxygen demand
km	kilometer
N	nitrogen
N2O	Nitrous oxide
P	Phosphorus
PM10	Particular matter
POPs	Persistent Organic Pollutants

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1 Introduction

1.1 Project Overview

The "Green Sharm Initiative" was initially launched with the goal of mitigating the impacts of tourism development, and other development activities on biodiversity and Sharm El Sheikh's environmental sustainability.

The project was superseded by the currently proposed United Nations Development Program – Global Environmental Facility (UNDP-GEF) Project which addresses risk management requirements in a number of sectors/topics to ultimately achieve sustainable and resilient developments and improve the quality of life in Sharm El Sheikh. More broadly, the project seeks to contribute to a transformational change of urban planning and development to meet the economic, mobility and social needs of city residents, while also contributing to climate change mitigation and more sustainable and climate resilient cities in general in accordance with the Sustainable Development Goals.

The Green Sharm El Sheikh project will act as a model integrated and ecologically sustainable tourism city of national and international importance through the adoption of further low-carbon technologies, good waste management practices and a further-enhanced protection of its natural capital basis.

1.1.1 Waste Management Challenge in Sharm El-Sheikh

The development of Sharm El-Sheikh as a recreational and tourist site with luxury resorts, restaurants, and the coast. Located at the southern part of Sinai, Sharm El-Sheikh is distinguished by a diversity of wildlife species and other available natural resources. Sharm El-Sheikh is characterized by barren terrain with limited vegetation cover, diversity of landscapes, clear skies and clear water with shallow coral reef community. The entire Sinai region is deeply dissected by the river valleys (or wadis) that eroded earlier geological periods. [1]

Urban and tourism activities generate a significant amount and diversity of waste, average daily generation per capita which falls within the highest category in Egypt. This raises the risk of being dumped in ecologically sensitive areas and changing animal behavior.[2] Waste dumps attract scavenging species such as vultures and gulls and results in the accumulation of plastics and toxic compounds in the ecosystem and food chain Solid and liquid waste releases by tourism and fishing boats are a concern for marine biodiversity and corals.

[1] https://www.env.go.jp/earth/coop/coop/c_report/egypt_h16/english/pdf/016.pdf

[2] Quantities has been confirmed by several surveys conducted at selected hotels during the Green Sharm Project PPG phase.[2]

In addition, wastes and plastics being blown into the sea, marine litter entering into the sea as from shipping and fishing and marine litter entering indirectly via fluvial and aeolian systems from terrestrial environments can pose major risks in coastal areas such as Sharm El Sheikh.

The total quantity of waste generated varies over time within the Governorate of South Sinai and depends directly on the hotel occupancy. For example, in 2010, a peak tourism year, the produced Municipal Solid Waste (MSW) was approximately 334 tons per day.

Waste collection of waste in hotels within Sharm El-Sheikh is carried out by private contracted companies. There are many private collector companies, biggest of which is Zahrit Ganoub Sinaii collection company.

In residential areas, about 70% of the population are served with waste collection services. Wastes is collected by private collectors or by the municipality, who collect the waste daily. Waste is then transferred to the sorting/composting plant or to the dumpsite depending on the type of waste.

There is one sorting/composting plant in Sharm El-Sheikh, established in 2006 with funding from the European Union. Following approval by the Cabinet of Ministers (20 February 2019), the Governorate of the South Sinai, which owns the waste management facilities, awarded a ten-year sole-source contract to the Zahrit Ganoub Sinaii Company to:

- operate and raise the efficiency of a plant for sorting and baling the recycables and making organic compost from agricultural waste in the al Khanassir area of Sharm El Sheikh;
- and to operate the landfill for the treated waste that cannot be recycled.

In its current state, the plant can only accommodate for about 100,000 t/day, a third of the total waste generated and received from residential and hotels.[3]

In a parallel system, separated organics extracted from mixed waste are acquired by the Bedouin communities directly from the hotels or from the MBT facility to feed their animals. After obtaining the useful fractions, the remaining /rejected waste, is either open burned for space reasons, or left in the area according to Bedouins accounts[4].

The Governorate of South-Sinai implemented a few measures to increase the waste management efficiency, including the construction of a new engineered landfill and contracting new waste collection companies such as Bea'h and Green Planet to ensure a more structured and monitored collection.

While the hygiene conditions in Sharm El Sheikh have generally been found acceptable during the Consultant's site visit, the adequacy of some of the solid waste management stages/operations have been found to be in need for improvement.

[3] Consultation activities with Zahret Ganoub Sinai Company
[4] Bedouins in Tahrir Area

This confirms some of the Environmental and Social Management Framework (ESMF) risks related to inadequate waste collection in some non-tourist areas; plastic waste blown into the sea; littering, dumping and burning of wastes.

In addition to the measures implemented by The Governorate of South-Sinai Sharm El-Sheikh is currently facing the challenge to lower the amount of wastes that is currently been dumped with no further treatment. Increasing the rates of waste separation, sorting and recycling (plus avoiding of waste) are the key requirements by the waste management component defined within the ESMF.

1.1.2 Previous Documents

An ESMF was prepared for the UNDP office in Egypt, to address the environmental and social impacts and risks of the GEF-funded Green Sharm El Sheikh project and achieve the Project's GEF targets (namely to achieve the main project goals, namely, to achieve climate change mitigation in Sharm El Sheikh and transform the City to a sustainable and climate resilient city in line with the Sustainable Development Goals)[5] while ensuring UNDP's Social and Environmental Standards (SES) are implemented.

The waste management sector was identified as one of two main priority areas of intervention due to the sensitivity of the associated issues, for example (i) ability to adversely impact critical habitats (ii) involve significant displacement and/or resettlement, (iii) produce significant quantities of greenhouse gases, (iv) may adversely impact the rights, lands, resources and territories of the indigenous peoples, or (v) other circumstances that reflect potentially significant adverse impacts.

The Workstream document further proposed six activities as a pilot to improve Sharm El Sheikh's municipal solid waste:

- **Activity 1.** Install proper working organization of public waste management in Sharm El-Sheikh.
- **Activity 2.** Operational improvement of separate waste collection at hotels
- **Activity 3.** Plastic ban and green purchasing guidelines for alternative products
- **Activity 4.** Technical assistance for the development of the sorting facility at Wadi Khanassir
- **Activity 5.** Check options for best treatment of separate collected organics.
- **Activity 6.** Monitoring and optimization of further treatment of other waste fractions

Activity 1 was essentially identified as a technical assistance. It included taking into account the contract signed by the Governorate with Zahrit Ganoub Sinai, and existing contracts with waste collectors and transporters. The framework did not identify any inherent social or environmental risk for this activity, other than the need to consult all stakeholders including waste-workers and other persons that depend on waste for their livelihoods.

The ESMF further identified the environmental and social risks of Activity 2 as being low. They would arise if the Project directly involved the separation of waste, and consists mainly of occupational health and safety and labour management risks.

[5] ESMF Document

The environmental and social risks of Activity 3 according to the ESMF are low. The activity would consist of technical assistance to prepare regulations and procedures for banning plastic. This will reinforce the existing policy in place (governmental decree) for banning single use plastic bags in the city of Sharm El Sheikh. The ban would be in line with UNDP's environmental standards, as well as part of a worldwide effort.

The proposed activities 4, 5 and 6 would involve the Project directly in the management of solid waste, including the management of the Al Khanassir waste site. In fact, the Project is conceptually tied to the performance of the waste site, because the Project's target reduction in greenhouse gas (GHG) emissions (55 000 tons of CO2 per year, mainly from methane gas and the lost energetic potential of non-recycled waste), and UPOPS releases (6.5 grams of toxic equivalents (TEQ)/year, mainly from the open burning of waste) can only be attained through the improved management of the waste site.

As per the ESMF requirements, the ESIA will address the environmental and social risks associated with the waste site's performance for three reasons:

1. the direct link between the Project's target outcome and the performance of the waste site
2. the need for the Project to assume the environmental and social risks associated with its target outcomes
3. the presence of an unknown number of waste-workers, particularly at the waste disposal site, whose livelihoods are dependent on their access to the waste, as well as the livelihoods of an unknown number of persons that rely on access to organic waste to feed their livestock.

The main purpose of this assignment is to carry out an Environmental and Social Impact Assessment (ESIA) of the activities involved in the waste management waste stream proposed as part of the Green Sharm project to address the SWM and to provide Environmental and Social Management Plan (ESMP) including_ guidelines outlining measures, processes, institutional arrangements, procedures tools and instruments that need to be adopted by the project and integrated into project implementation[6] to mitigate any adverse environmental or social impacts.

Since the Projects and Programs will be financed through the UNDP-GEF funds, the document will screen projects against UNDP Social and Environmental Standards (SES). Therefore, all activities and interventions funded under this project will be required to satisfy the UNDP SES, in addition to conformity with the relevant Egyptian legislation. The objective of the Environmental and Social Impact Assessment/Environmental and Social Management Plan (ESIA/ESMP) is therefore to ensure that any proposed activities /interventions will:

[6] Possibly suggest alternative projects to be tendered in the two phases mentioned in the TOR, namely: (i) feasibility study & business plan, (ii) service contract for implementation & operation (e.g. DBO – design/build/operate).

- Minimize any negative social and environmental impacts as a result of the project or their cumulative effects and enhance positive environmental and social outcomes if possible
- Protect human health
- Prevent or compensate any loss of livelihood

The document provides the necessary background for environmental and social dimensions to be built into the design of the project in order to ensure that project implementation will take place in an environmentally and socially sustainable manner. Overall, the proposed project activities will contribute to improved solid waste management in the Sharm El Sheikh.

1.2 ESIA Scope

As agreed with UNDP's focal point, the scope of the ESIA covers the activities identified within the workstream document. Main activities include:

Table 1: Interventions Suggested

Activity	Activity Name	Type of Intervention	Status
Activity 1	Install proper working organization of public waste management in Sharm El-Sheikh, namely, the contract signed by the Governorate with Zahrit Ganoub Sinaii, and existing contracts with waste collectors and transporters	Consultancy	Implemented. There is a contract with Zahrit Ganoub Sinaii for the operation and capacity raising of the MBT plant and disposal sites. Planned but not implemented. There is a contract with Bea'h and Green Planet for the collection of waste.
Activity 2	Operational improvement of separate waste collection at hotels (Pilot project carried out in 20 hotels to improve segregation quality)	Consultancy/financing	Not yet implemented
Activity 3	Plastic ban and green purchasing guidelines for alternative products	Consultancy	There is a policy in place (gov decree) for banning Single-use plastic (SUPs) bags in the city of Sharm ElSheikh. Also, a number of capacity building and awareness raising activities were done prior to COP27. This

			activity aims at developing guidelines to reinforce the policies in place and put forward green purchasing guidelines for alternative products. Not yet implemented
Activity 4	Technical assistance for the development of the sorting facility at Wadi Khanassir	Consultancy	Not yet implemented
Activity 5	Check options for best treatment of separate collected organics (Possible anaerobic composting activities within the premises of the hotels or at the waste water treatment plant)	Consultancy	Not yet implemented
Activity 6	Monitoring and optimization of further treatment of other waste fractions	Consultancy	Not yet implemented

1.3 ESIA Objectives

Solid waste activities were identified by the ESMF as one of two sectors requiring greater attention because of the sensitivity of the associated issues.

Based on the above background, this ESIA was prepared to respond to the following:

(i) ESMF requirement for the development of an ESIA for solid waste management (as a priority issue for achieving the main project's requirement.

(ii) To address the main environmental and social risks identified in the ESMF, verify or redefine the risks and prepare a management plan to mitigate them. These include the following:

a. Describe the stance of waste pickers (if they exist) and identify any risk as a result of the project's activities (whose livelihoods is dependant on waste for their livelihoods- Risks of activity 1)

b. the need to consult all stakeholders including waste-pickers (if they exist) and other persons that depend on waste for their livelihoods. (Risks of activity 1)

c. Risks of activity 2 which would arise if the Project directly involved the separation of waste, and consists mainly of occupational health and safety and labour management risks.

d. The risks of the proposed activities 4, 5 and 6 which would involve technical assistance for the management of the Al Khanassir waste site to limit the UPOPS releases (6.5 grams of toxic

equivalents (TEQ)/year, mainly from the open burning of waste) through the improved management of the waste site.

e. waste separation and sorting routines including sorting facility

f. treatment of separated wastes, including recycling, composting, treatment of hazardous (e.g. electronic, medical) wastes

g. final treatment & disposal (landfilling)

(iii) Describe positive impacts of efforts to avoid waste and increase recyclability esp. by less packaging, reduction of single-use plastic, replacing plastics by paper, reduction of multicomponent packaging

(iv) Describe possible intervention related to waste collection modalities including relevant transportation and collection infrastructure in the city, at tourism facilities (e.g. supporting establishing a waste collection schedule & plan for hotels, diving centers & boats/jetties) and other industries and businesses

(v) organization and operational concept including costs for investments and operations.

1.4 Methodology

Due to the short duration of the assignment, the Consultant used a combination of first hand data and professional judgement to fill in the gaps where it was not possible to obtain data directly. This included:

1.4.1 Meeting with Waste Management Regulatory Authority (WMRA)

The first visit carried out was with WMRA to obtain an overview of the solid waste situation in Sharm El-Sheikh. The officials provided the Consultant team with Mr. Ibrahim, owner of Zahrit Ganoub Sinaii, operator of the landfill sites and the MBT facility.

1.4.2 Site visits

The Consultant carried out a two-day site visit in the period of which included visits to the Kanasir dump, the MBT facility, the new landfill facility a drive around the city and specific observation of a sample residential area within Sharm El-Sheikh. The Consultant also visited the inhibited area close to the landfill, namely Tahrir area.

1.4.3 Consultation activities and Meetings

The Consultant carried out a number of consultation activities and meetings to collect data, verify information and obtain opinions of major stakeholders.

1.4.4 Literature review

A literature review was carried out to collect data and review documents in the public domain. These included but are not limited to baseline data, project data, etc.. The Consultant also reviewed the ESMF and the workstream previously prepared for the project as major starting points for the assignment.

1.4.5 Consultant's Assessments (such as for waste quantities)

The Consultant used the data collected (primary and secondary data) to carry out an assessment of the waste quantities, waste categories, project impacts and mitigations.

The methodology is illustrated in the Figure below

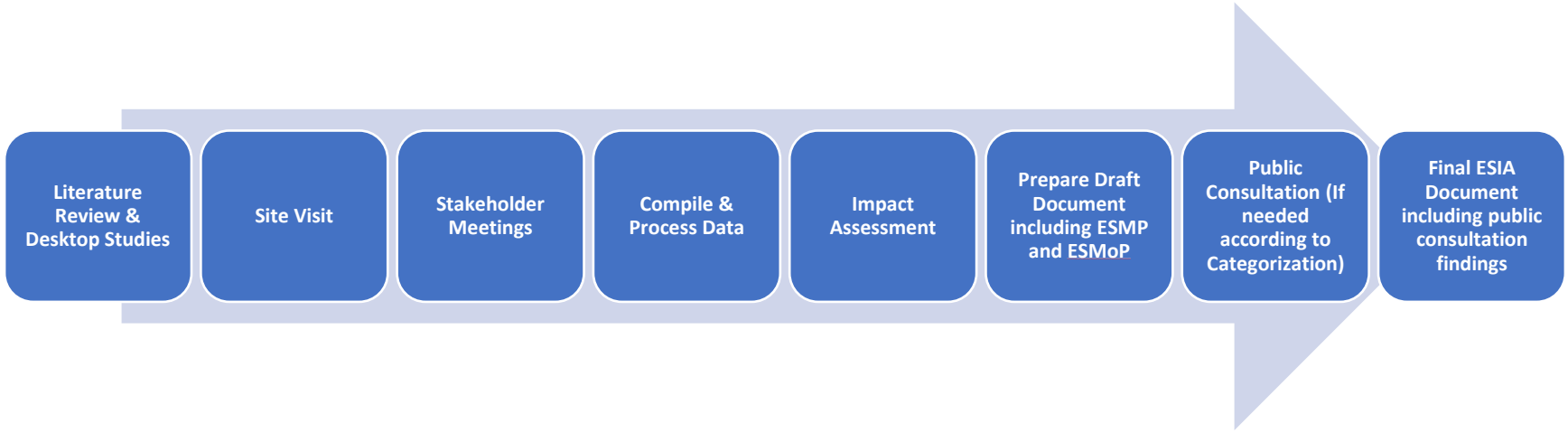

Figure 1: Methodology Adopt

1.5 Limitations

The conclusions included within this document are based on a limited number of consultation activities due to time restrictions. It is envisaged that further consultation activities may be required to raise the certainty of the conclusions and involve affected communities further with regards to the project activities.

It should also be noted that the ESIA impacts assumes only the waste workstream impacts which are much smaller than if the pilot phase is implemented in a full-blown project.

2 Legal and Institutional Framework

2.1 Categorization

The Overall project is classified as a **high risk Category Project** under UNDP categorization primarily to reflect the risks involved in solid waste management at Sharm El Sheikh level due to the large geographic scope under the project and the range of different activities.

2.1.1 UNDP Categorization

According to Annex 2 of the "Guidance Note UNDP Social and Environmental Standards (SES)"[7], all Municipal solid waste processing and disposal facilities fall under High-Risk Activities. This is in line with the categorization included in the ESMF.

2.1.2 EEAA Categorization

Since the social aspects are not included in EEAA's guidelines, and the scope is only limited to the pilot project activities (limited scope), the project is categorized as a Scoped B project with limited impacts.

2.2 National Legislations and Guidelines

This section describes the legal and administrative framework for the proposed project. It lists the national laws requirements as well as the best practice requirements pertinent to the project. In addition, it provides an overview of the requirements of the international conventions.

These laws must be adhered to by all parties involved in the Project throughout the planning and construction, operation, and decommissioning phase. These legislations include: (i) those issued by EEAA (laws, regulations and instruction), and (ii) the relevant national legislations issued by other line ministries (laws, regulations, instructions, standards).

The table below lists the key relevant legislation and regulator/entity relevant to this project

Table 2: National Legislation and Guidelines Governing the E&S Compliance for the Project during all Phases

Legislation	Relevant Article	Requirements
Geology, hydrology, hydrogeology		
Law 4/1994	Article 33 of the Executive regulations of Law 4/1994	▪ The owner of the project is responsible for decontaminating the area/soil in case of relocation or decommissioning
Waste Management Law		

[7]https://info.undp.org/sites/bpps/SES_Toolkit/SES%20Document%20Library/Uploaded%20October%202016/UNDP%20Social%20and%20Environmental%20Screening%20Procedure_JULY2022_ENGLISH.pdf

Legislation	Relevant Article	Requirements
Law **No. 202/2020**	The Executive Regulations of **722/2022**	The Waste Management law is the new law that has been ratified to govern, manage, and most importantly regulate the waste management industry in Egypt. The law also included the legal instrument for the official creation of WMRA – Waste Management Regulatory Authority, which will now be responsible to oversee the waste management sector under the Ministry of Environment and to review the develop the national strategy to manage waste in Egypt. The Executive Regulations of **722/2022** provides the regulative tools for the implementation of the **202/2020** law. Overall, the **202/2020 Law** can be split into the following primary segments: 1. General Provisions 2. Waste Management Regulatory Authority 3. General Policies and Obligations 4. Non-hazardous 5. Hazardous Waste 6. Penalties The Executive Regulations follow the same blueprint and provide more detail into the definitions, the responsibilities with regards to the implementing entities for the waste management law and more information regarding how each type of waste is to be managed from collection, storage to disposal. This Law provides the different requirements for waste disposal (for the different types of waste generated from different) • Promotion of reduce, reuse and recycle • WMRA approval is required prior to mixing waste • Waste Collection and Disposal must be done by entities and companies that are appropriately registered (for the type of waste they are disposing), in addition to that 10% of their profits must be allocated to strengthening WMRA • Penalties for violating the law can be subject to penalties up to 1000 EGP to 1 million EGP.
Law 4/1994	Article 37 of the law	Municipal administrative units shall, in agreement with The Egyptian Environmental Affairs Agency EEAA, designate the sites for throwing, sorting and treating of garbage and solid waste according to provisions of this law and its Executive Regulation.

Legislation	Relevant Article	Requirements
Executive regulation of law 4 No.1095 in the year 2011	Article 38 Clause III	Places of solid waste dumping, treatment facilities and solid waste landfill sites should be at a distance of 1500 meters from the nearest residential community, and facilities for treating animal and poultry waste, agricultural waste should be at a distance of 500 meters from the nearest residential communities. It is permissible for reasons of necessity approved by the Egyptian Environmental Affairs Agency, in coordination with the concerned authorities, to adjust these distances in rural areas according to the conditions of the region and the governorate.
Control of the wastewater discharge into the sewage system and public network.		
Ministerial Decree 44/2000, Decree of Law 93/1962	Article 14	▪ The law prohibits the disposal of domestic, industrial and commercial wastewater, treated or untreated, in public drainage system without obtaining a prior approval. ▪ Article 14 of the executive regulations set the parameters required regarding the quality of the wastewater discharged to the public sewage network. ▪ The owner of the project should abide by the limits stated in article 14 of the Executive regulations of Law 93/1962
Marine Discharge.		
Environmental Protection Law 4/1994 amended by Laws 9/2009 and 105/2015 provides the basis for regulating impacts on the aquatic environment	Annex 1 of the Executive Regulations (ER) of Law No. 4/1994 amended by Law 9/2009 and 105/2015 (as amended by Prime Ministerial Decree No. 1741/2005, 1095/2011, and 964/2015) concerning the protection of the environment	Since Sharm is a coastal area, the law phrases relating to the marine environment apply. ▪ The law prohibits the draining and disposing of certain substances into the marine environment
Biodiversity		

Legislation	Relevant Article	Requirements
Law 4 of 1994	Article 28, as amended by Law 9 of 2009. Annex 4 of the Executive Regulations of law 4/1994, amended by Prime Minister Decree 1095 of 2011	▪ Defines fauna and flora which are forbidden to be hunted or disturbed. ▪ Ensure that no species are being disturbed and implement all mitigation measures needed to reduce the impact on any fauna and flora in the vicinity of the project ▪ Identifies the aquatic organisms, including coral reefs fish (non-commercial), cartilaginous fish, aquatic and terrestrial invertebrates and coral reefs present in the Egyptian Natural Habitats
Natural Protectorate		
Law 102/1983	Articles 2 & 3	▪ The Law preserves such areas by prohibiting activities susceptible to harm the environment of designated natural protectorates
Archaeology and cultural heritage		
Law 117/1983	Article 1	▪ Defines a monument as a building or movable property produced by different civilizations or by art, sciences, literature and religions from prehistoric era and during successive historical eras until a hundred years ago or historical buildings.
	Article 2	▪ States that any building or movable property that has an historical, scientific, religious, artistic or literary value could be considered as a monument whenever the national interest of the country imposes its conservation and maintenance without adherence to the time limit contained in the preceding Article no.1
	Article 5	▪ States that the Supreme Council of Antiquities (SCA) is the competent authority responsible for antiquities in Egypt.
	Article 20	▪ States that license of construction in archaeological sites or land is not permitted. It is prohibited to make any installation or landfill or digging channels, construct roads, agricultural land or for public benefits in the archaeological sites or land within its approved border lines. ▪ The Article additionally, states that a buffer zone around the monument or the site is defined as three kilometres in the uninhabited areas, or any distance determined by the SCA to achieve environmental protection of the other parts of the monument in the surroundings (article 20-Ch.1).

Legislation	Relevant Article	Requirements
		▪ The provisions of this article (20) apply on land which appears to the SCA - based on conducted studies – that there is a probable existence of monuments in the subsoil. ▪ The provisions of this article are also applied to desert and areas where quarrying work is licensed.
	Article 22	▪ States that license of construction in the immediate vicinity of archaeological sites within populated areas could be delivered by the competent authority, after the approval of SCA. ▪ The competent authority must state in the license the conditions which the SCA emphasizes to guarantee that the building does not have a negative visual impact on the monument and its direct buffer zone protecting the archaeological and historical surroundings. ▪ The SCA has to pronounce its verdict on the license demand within 60 days of the date of submission. Otherwise, the elapsing of this period is regarded as a decision of refusal.
	Article 23	▪ States that the SCA should take the necessary steps to expropriate land that is found in or kept in place and registered according to the rules of this Law. (Article 23- Ch.1). [These rules are defined in the second chapter of the Law 117 – articles 26-30]. ▪ The Ministry of State for Antiquities must be notified in the event that an unrecorded ruin is found by any person (Article 23).
	Article 24	▪ States that everyone finding by chance part or parts of a monument in its place must promptly inform the nearest administrative authority within forty-eight hours. ▪ Although there are no cultural heritage areas in the site vicinity, the ESIA report will refer to relevant regulations for unexpected cases of chance finds.
Air quality and noise		
Law 4/1994 amended by Law 9/2009 and ER 710/2012	Article 42 of Law 4/1994 amended by Law 9/2009 Article 44 of ER 710/2012	▪ Maximum allowable limits for ambient noise intensity and maximum exposure duration
	Article 38 of ER	▪ Open burning of garbage and non-hazardous solid waste is strictly prohibited, and garbage and solid waste shall only be

Legislation	Relevant Article	Requirements
		dumped or treated in designated areas away from residential, industrial, agricultural and waterways.
		▪ Dumping areas should be bound by a wall, away from obstruction, traffic and pedestrians and take into account the coverage of volatile soil so as not to cause air pollution. ▪ Transporting waste and dust resulting from excavation, demolition and construction in special containers or using transport vehicles prepared and licensed for this purpose. ▪ (A) The vehicle shall be equipped with a special box or a tight cover that prevents the spread of dust and debris to the air or falling on the road. ▪ (B) The vehicle shall be equipped with special equipment for loading and unloading. ▪ (C) The car should be in good condition according to the rules of safety, durability and lights and equipped with all safety devices. ▪ Ensure that the places to which this type waste transported so that a distance of not less than 1.5 km from the residential areas and be of a low contour level and settled after filling and filling.
ERs (amended by Decree 1095/2011 amended by Decree 710/2012)	Annex 5	▪ Maximum limits of ambient air pollutants
	Annex 6	▪ Permissible limits of air pollutants in emissions
	Annex 8 and Annex 9	▪ Maximum allowable limits for air emissions, heat stress, ventilation rates within the work environment
Modified ERs (710/2012) of Law 4/1994	Article 37	▪ Maximum allowable limits for exhaust gases from machines, engines and vehicles.
Law 4/1994	Article 36	▪ It is prohibited to use machines, engines or vehicles whose exhaust emissions exceed the limits set by the executive regulations of this Law.
Law 4/1994 and its modified ERs	Article 35 of Law 4/1994 and article 34 of its modified ERs	▪ Maximum allowable limits for ambient air pollutants stated should be met by the contractor and operator throughout the lifetime of the plant.

Legislation	Relevant Article	Requirements
Occupational health and safety		
Law 4/1994	Articles 43 – 45 of Law 4/1994, which address air quality, noise, heat stress, and the provision of protective measures to workers.	▪ The owner of the project should abide by the limits stated in Annex 7 of the Executive regulations ▪ In case the limits are exceeded, special protective equipment should be made available (earmuffs, masks…) (Annex 9) ▪ In case the limits are exceeded, the workers should have rests as specified by the limits (especially for noise and vibration from electric jack hammers or any other ramming equipment) ▪ Conduct regular medical check-ups for workers that are facing noise, vibration or heat stress exceeding the limits
Law 12/2003 on Labour and Workforce Safety	Articles 80-87	▪ Regulates working hours and rest times for workers ▪ The working hours shall include a period of one or more meals and rest not less than one hour in total and the period shall not exceed five consecutive hours. The competent minister may, by a decision, determine the cases or works which are imperative for technical reasons or operating conditions. ▪ Work hours and rest periods should be organized so that the period between the beginning and the end of working hours does not exceed ten hours per day. ▪ Work shall be organized at the facility so that each worker shall receive a weekly rest of not less than 24 hours after six working days at most. In all cases, weekly rest shall be paid. ▪ The employer shall put on the main doors used by the workers for entry, as well as in a visible place in the establishment a schedule showing the weekly rest day, working hours and rest periods for each worker and the amendment to this schedule.
	Book 3 - Single worker contract: Article 32	The employer shall be obliged to issue the contract in writing in Arabic in three copies. The employer shall keep one and deliver a copy to the worker. In particular, the contract shall include the following data: ▪ Name of employer and place of work. ▪ The name of the worker, ▪ his qualification, ▪ his profession or craft, ▪ his insurance number, ▪ his place of residence and what is necessary to prove his identity. The nature and type of work being contracted.

Legislation	Relevant Article	Requirements
		▪ If there is no written contract for the worker, the unit to prove his rights, all methods of proof. The employer shall be given a receipt for the papers and certificates he has deposited with him.
Law 12/2003 on Labour and Workforce Safety and Book V on Occupational Safety and Health (OSH) and assurance of the adequacy of the working environment	Minister of Labour Decree 48/1967. Minister of Labour Decree 55/1983. Minister of Industry Decree 91/1985 Minister of Labour Decree 116/1991.	▪ The owner of the project is bound with the provision of protective equipment to workers and fire-fighting/emergency response plans. Moreover, the following laws and decrees should be considered: ▪ The contractor should have appropriate number of first kits in relation to the size of the site and the number of workers on site
	Article 211 and article 34 of the Decree of the Minister of Labour and Manpower no. 211/2003	▪ The establishment should prepare, records / reports/register for chemical safety
Law 137/1981	Article 117	▪ The employer should inform his workers of the hazards associated with non-compliance with safety measures
Decree 458/2007		▪ Egyptian Drinking Water Quality Standards should be met for all water bought and stored on site for the workers' use.
Socio-economics		
Law 94/2003		▪ The Law on Establishing the National Council for Human Rights (NCHR) aims to ensure respect, set values, raise awareness and grant observance of human rights. ▪ At the forefront of these rights and freedoms are the right to life and security of individuals, freedom of belief and expression, the right to private property, the right to resort to courts of law, and the right to fair investigation and trial when charged with an offence. ▪ This Constitution came into force after a public referendum on 11th September 1971 and was amended on 22nd May 1980 to introduce the Shoura Council and the press.

Legislation	Relevant Article	Requirements
EEAA EIA guidelines	▪ Paragraph 6.4.3.1 Scope of Public Consultation ▪ Paragraph 6.4.3.2 Methodology of Public Consultation ▪ Paragraph 6.4.3.3 Documentation of the Consultation Results ▪ Paragraph 7 Requirement and Scope of the Public Disclosure	▪ Conduct a public consultation as part of the ESIA study according to the EEAA guidelines methodology. The involvement of the public and concerned entities in the EIA planning and implementation phases is mandatory for Category C projects through the public consultation process with concerned parties. ▪ Preparation of the Public Consultation Plan before starting the consultation activities in the EIA scoping phase, the project proponent prepares a plan indicating the methodology of the public consultation to be adopted in the two public consultation phases (EIA scoping phase and consultation on the draft EIA). The plan should indicate the concerned parties that will be consulted, method of consultation and other points. ▪ An individual chapter in the EIA will be prepared for public consultation ▪ Disclosure of relevant material is an important process and should be undertaken in a timely manner for all Category C projects. This process permits meaningful consultations between the project proponent and project-affected groups and local NGOs is required to take place. Before the public consultation on the draft EIA, the draft technical summary in Arabic should be disclosed to all concerned parties.

2.3 Best International Practices

2.3.1 UNDP SES

UNDP's SES comprises five programming principles, eight Project-Level Standards and five Procedures and Accountability principles.

These are listed below.

Table 3: Screening of UNDP SES

Project Level Standard	Project Status	Justification
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management	Triggered	Inadequate waste management can have negative impacts on biodiversity through direct means such as the ingestion of plastic microbeads by marine animals, and indirectly through landfill sites that promote the growth of methane-producing bacteria, a greenhouse gas that contributes to climate change.
Standard 2: Climate Change and Disaster Risks	Triggered	• Methane gas generated from the anaerobic decay of waste in landfills is one of the major greenhouse gas emissions that contribute to climate change. • In addition, burning of waste releases GHG, namely, CO2, methane (CH4) and nitrous oxide (N2O). Since landfills are part of the workstream, it is triggered.
Standard 3: Community Health, Safety and Security	Triggered	Improper waste management and littering may cause hygiene problems, pests, visual nuisance and diseases to communities
Standard 4: Cultural Heritage	Not Triggered	• Cultural heritage impacts are not applicable. While Sharm El Sheikh features some important cultural heritage sites, the project will not introduce any additional activities that will negatively affect cultural heritage. • The closest World Heritage site is the "Saint Catherine Area", including the orthodox monastery of Saint Catherine. It is located approximately 85 km from Sharm El Sheikh. No Project activities are planned in its vicinity.

		• The Project does not include any excavations or other environmental changes and thus no Change Find Procedure is developed.
Standard 5: Displacement and Resettlement	Triggered	No physical displacement is expected as a result of the project activities. The Tahrir Bedouins are in principle, Nomad Bedouins, their relocation would be primary caused by change of circumstances as what happened 2 years ago based on the interviews. Economic displacement is only expected if composting of the organic stream is introduced (as was mentioned as a proposal in the workstream document). Organic waste is used for the Bedouin's livestock and since the Bedouin community depends on livestock as a source of income, this is the only activity that may result in economic displacement. Additionally, through site observation, there has been no identifiable scavenging activities that would trigger displacement. However, avoidance of the risk of economic displacement has been covered in the impacts assessment in section 6.4.5 and 7.3.5.
Standard 6: Indigenous Peoples	Not Triggered	Bedouins interviewed and engaged during site visits (The tribes that were interviewed were primarily the Tahrir Tribe that live near the facility.) have had different experiences and cannot be defined as indigenous peoples according to the UNDP definition. According to the ILO definition of indigenous people[8], which was referred to in SES 6, indigenous people "descent from populations who inhabited the geographical region at the time of conquest, colonization or establishment of present State boundaries. Egypt is an ancient civilization that dates back to more than 7000 years, which is much older than the earliest recorded settlement of any Bedouins in the Country. Bedouins on the other hand, are considered to be of Arab descent, originating in the Arab Peninsula, namely the Syrian Desert and Arabian Desert and spread across the rest of the Arab world in West Asia and North Africa between the 14th and 18th centuries. They are therefore

[8] https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_735607.pdf

		immigrants and not original occupants of the land. The definition cannot be applied to the Bedouins of Sharm El Sheikh. This has been described further in Table 20
Standard 7: Labour and Working Conditions	Triggered	Labour and working conditions apply to workers in the solid waste management, namely during collection, transport, treatment (MBT facility) and disposal and therefore apply to the workstream
Standard 8: Pollution Prevention and Resource Efficiency	Triggered	Improper solid waste management in general can be a major source of pollution. Improper management of waste during the implementation of the workstream will also be a continuation of the current situation and may contribute to pollution, including air emissions, soil and water pollution and noise. Furthermore, the standard might be relevant if feasibility studies are conducted for activities that cause pollution

Table 4: UNDP Programming Principles

Programming Principles
Principle 1: Leave No One Behind **Principle 2:** Human Rights **Principle 3:** Gender Equality and Women's Empowerment **Principle 4:** Sustainability and Resilience **Principle 5:** Accountability
Procedures and Accountability
Quality Assurance & Risk Management Screening, Assessment and Management of SES Risks and Impacts Stakeholder Engagement and Response Mechanism Access to Information Monitoring, Reporting and Compliance

2.3.2 Environmental International Agreements

Egypt has signed and ratified a number of international conventions committing the country to the conservation of environmental resources and protection of workers' health & safety and labour rights. The following table lists the key conventions:

Table 5: Relevant international Conventions and agreements to which Egypt is a signatory

Name of Multilateral Environmental Agreement	Date
Biodiversity and Natural Resources	
International Plant Protection Convention	1951
Agreement for the Establishment of a Commission for Controlling the Desert Locust in the Near East	1965
Convention on Wetlands of International Importance Especially as Water Fowl Habitat (RAMSAR)	1971
Convention Concerning the Protection of the World Cultural and Natural Heritage	1972
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	1973
Convention on the Conservation of Migratory Species of Wild Animals	1979
Protocol to Amend the Convention on Wetlands of International Importance Especially as Water Fowl Habitat	1982
Convention on Biological Diversity (CBD)	1992
Agreement for the Establishment of the Near East Plant Protection Organization	1993
United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa	1994
Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean	1995
African Convention on the Conservation of Nature and Natural Resources (revised)	2003
International Tropical Timber Agreement	2006
Hazardous Materials and Chemicals	
Convention Concerning Prevention and Control of Occupational Hazards Caused by Carcinogenic Substances and Agents	1974
Convention on the Prohibition of the Development, Production and Stock-Piling of Bacteriological (Biological) and Toxin Weapons, and on their Destruction	1972
Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal	1976
Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques	1976
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1989

Name of Multilateral Environmental Agreement	Date
Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa	1991
Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1995
Stockholm Convention on Persistent Organic Pollutants (POPs)	2002
Atmosphere, Air Pollution and Climate Change	
Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies	1967
Vienna Convention for the Protection of the Ozone Layer	1985
Montreal Protocol on Substances that Deplete the Ozone Layer	1987
(London) Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer	1990
United Nations Framework Convention on Climate Change	1992
(Copenhagen) Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer	1992
Kyoto Protocol	1997
Paris Agreement under the United Nations Framework Convention on Climate Change	2015
Health and Worker Safety	
International Labour Organization Core Labour Standards	1936
Convention Concerning the Protection of Workers Against Ionizing Radiation	1960
Convention Concerning the Protection of Workers Against Occupational Hazards in the Working Environment due to Air Pollution, Noise and Vibration	1977
Occupational Safety and Health Convention	1979

3 Project Description

3.1 Sources and Types of Municipal Solid Waste (MSW)

Municipal solid waste consists of everyday items that are disposed off intentionally, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries.

That being the case, some of this waste is of value and can be extracted from the waste stream to be used, reused, recycled or recovered.

For the purpose of this assessment, MSW considered waste mainly originating in residential and commercial urban areas. While other sources such as institutional waste do exist, these have not been included in the assessment due to lack of data and assuming that their contribution is insignificant. Waste generated from these areas, however, were assumed to be incorporated within the community generation rates. The assessment also excludes medical waste and wastewater sludge.

"Municipal waste" was therefore mainly assumed to originate from residential and commercial (which includes hotels) sources. The Table below summarizes the different sources, typical waste generators and types of solid waste generated.

Table 6: Summary of typical waste generators and types of solid waste generated

Source	Waste Generators/Source	Types of Solid Waste	Note
Residential	Residential units	Food waste, paper, cardboard, plastic, textiles, leather, yard waste, wood, glass, metal, ash, special waste (e.g., bulky items, consumer electronics, white goods, batteries, oil, tires) and household hazardous waste	Included
Commercial	Stores, hotels, restaurants, markets, office buildings	Paper, cardboard, plastic, wood, food waste, glass, metal, special waste, hazardous waste	Included
Institutional	Schools, public hospitals, prisons, government centers	Same as commercial	Not included
Construction and Demolition	New construction sites, road repair, renovation sites, demolition of buildings	Wood, steel, concrete, dirt, etc.	Not included
Medical	Clinics and hospitals		Not included

3.2 Waste Quantities and Characteristics

3.2.1 Waste Quantities

The quantity and quality of solid waste generated in a city/area is dependent on the activities undergone within, and the scale on which it is carried out (mostly dependent on income level). An evaluation of the composition of different waste streams is therefore a crucial phase in assessing the general waste management situation in Sharm El Sheikh and identifying the hotspots .

In general, solid wastes can be classified as municipal, industrial, green or special wastes. Municipal solid wastes are the broadest category of them all, constituting commercial, institutional, construction and domestic wastes.

The Consultant broadly classified the solid waste generated in Sharm El Sheikh according to its source of origin.

Table 7: Solid Waste Generated in Sharm El Sheikh by Source

Type	Quantity	Unit	Waste Generation Rate (kg/unit/day)	Maximum Waste Generated (Kg/day)
Hotels				
Hotel	54,000[9]	beds	3.75[10]	202,500
Residential				
Other tourist not in hotels	73,000[11]	Tourists	1.5[12]	109,500
Residential	35,000	persons	0.9[13]	31,500
Markets[14]				
Naama bay Market		m2		1,425

[9] Figure for 177 hotels in 2017 and assuming 100 % Occupancy

[10] A typical 100 bed hotel generates over 375kg of waste per day, hence 3.75kg/bed /day was assumed. Source: https://www.inciner8.com/general-waste/hotel-resort-waste-incinerators

[11] According to The electronic portal of South Sinai Governorate, the total number of tourists was 127,000. Since the total number of beds is less than the number of tourists recorded, the remaining numbers are assumed to be tourists who do not reside in hotels.

[12] Per Capita Generation Rate in Similar Coastal Areas- Obtained from World Bank report prepared for a prospective solid waste management facility at Ari Atoll

[13] Typical value for medium income areas obtained from World Bank report "what a waste: a global Review of Solid waste management".

[14] Main markets in Sharm El Sheikh, namely Naama bay Market, Soho square, Gardens bay, Old Market and Nabq shopping center

Soho square		m2		1,425
Gardens bay		m2		1,425
Old Market		m2		1,425
Nabq shopping center	2500[15]	m2	0.57[16]	1,425
Other (15 %)[17]				52,593
Total Waste Generated (kg/day)				403,219
Total Waste Generated (tons/day)	403.22			

3.2.2 Waste Characteristics

Municipal solid waste in Egypt is known for its high organic content. Hotel waste generators are worldwide considered to have some of the highest quantities of organic type wastes in relation to other sources due to the services offered, especially in relation to food and beverage services and green areas. Since accurate data on hotel waste characteristics in Egypt is not available, and because the organic waste percentage characterized in the Egyptian waste is higher than typical hotel values recorded elsewhere, the Consultant considered the municipal characterization to also be applicable for the hotels and the commercial facilities.

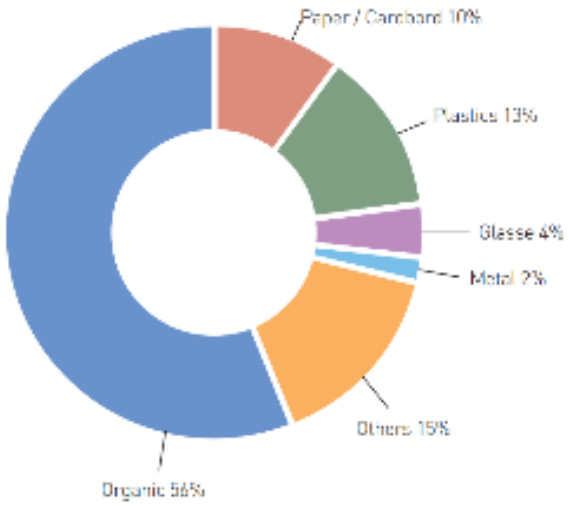

Figure 2: Waste characterization

The characterized waste quantities are summarized in the Table below.

[15] Areas need to be revisited and checked
[16] Source: https://www2.calrecycle.ca.gov/wastecharacterization/general/rates
[17] Number will be revisited in the final version of the report

Table 8: Solid Waste Generated in Sharm El Sheikh by Source Municipal solid composition[18]

Type	Organics (kg)	Recyclables (kg)	Others (kg)	Total
Hotels				
Tourists in Hotel	113,400	58,725	30,375	202,500
Residential				
Other tourist not in hotels	61,320	31,755	16,425	109,500
Residential	17,640	9,135	4,725	31,500
Markets				0
Naama bay Market	798	413	214	1,425
Soho square	798	413	214	1,425
Gardens bay	798	413	214	1,425
Old Market	798	413	214	1,425
Nabq shopping center	798	413	214	1,425
Other (15 %)	33,870	17,540	9,072	60,483
Total Waste Generated	231,018.38	119,634.52	61,879.92	412,532

3.2.3 Current Waste Flows in Sharm El Sheikh

3.2.3.1 Hotels

Waste generated from hotels is separated into different streams. Transport Companies collect the different waste streams and transport them to the MBT facility. According to meetings with a collection company, however, the recyclables fraction arrives at their facility in a mixed form.

The organic waste stream from hotels is sold directly to Bedouins who feed the waste to their cattle.

3.2.3.2 Residential Areas

Waste generated from residential units is stored in mixed form in wheelie bins at the entrance of the buildings. The building gate keeper or residents of the buildings then transport the waste from the wheelie

[18] Source: Municipal solid waste composition in Egypt (2012)

bin to large skip bins that are scattered in different locations. Waste collection workers then transfer the waste from the skips to their trucks.

The flow chart below illustrates the waste flows in Sharm El Sheikh City.

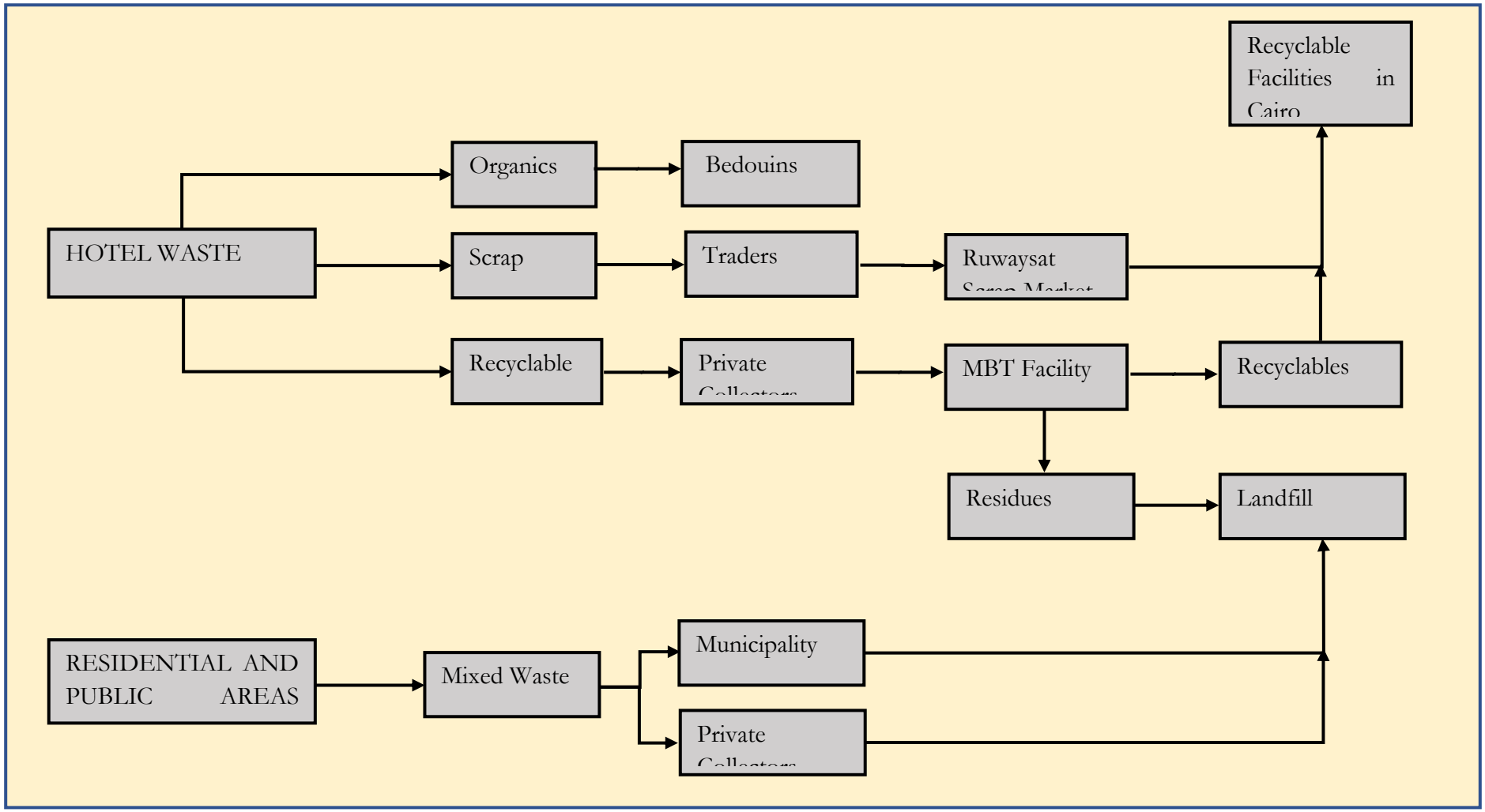

Figure 3: Waste flow in Sharm El Sheikh

3.3 Waste Management Responsibilities

3.3.1 Waste Collection and Transport (current)

Waste collection in Sharm El Sheikh is carried out as follows:

- Organics from hotels are given to Bedouin families who directly use it as feed for their livestock. As noted in the ESMF, the volume of organic waste used by local communities for their livestock is unknown, but can only be assumed to be equal to the organic fraction from the hotels. There is also no information regarding livestock or poultry numbers that are dependent on the organic waste.
- Mixed waste collection of other streams and organics that were not recovered from hotels is exclusively carried out by private collection companies owned by Bedouins such as Zahrit Ganoub Sinaii.
- Waste Collection from other areas (residential, commercial and institutional) is distributed by area between Bedouin collection companies and the municipality.

3.3.2 Waste Recycling

There is one MBT facility in Sharm El Sheikh, located adjacent to the landfill in Khanasir. The facility operator is Zahrit Ganoub Sinai Company owned by Mr. Ibrahim Hameed. The operator pays rental fees to the Government in return for the recyclables recovered.

The facility receives all recyclables arriving mainly from the hotels in addition to all green waste from farms, street sweepings and public areas.

The plant carries out compression and baling activities on the recyclables and composting of green wastes. The products from the facility include compost as shown below and bales of recyclables.

Figure 4: MBT Facility Products

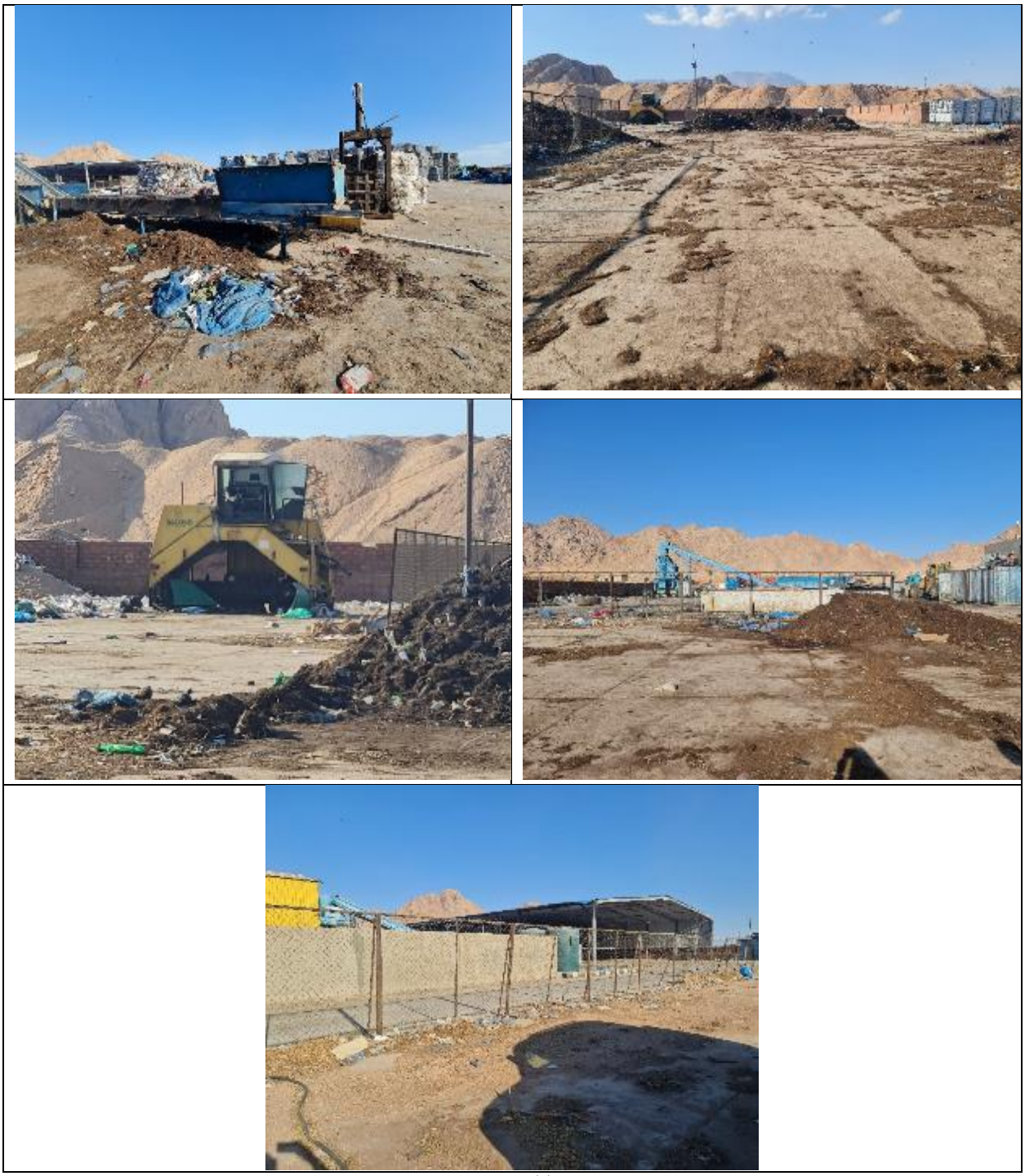

Figure 5: MBT Plant

3.3.3 Disposal

There are two disposal sites located next to each other in Khanasir.

- The current disposal site is an un engineered controlled dump. The operator dumps the waste and covers it with a layer of sand.
- There is a new engineered landfill that has been constructed but did not enter the operational phase.

Figure 6: Location of MBT Plant, New Engineered Landfill and Current Dumpsite

Figure 7: New Engineered Landfill

Figure 8: Current operational disposal site

3.3.4 Waste Scrappers and Pickers

According to the interview carried out with the City Council, Sharm El Sheikh used to house many informal waste pickers who used to practice the following:

- Empty waste bins on roads, carry out scavenging activities and leave the waste dumped along roads
- Transport waste to their settlements where it is hand sorted by children and the elderly
- Burn the remaining waste near their settlements to get access to metals, or leave it on site

The number of waste-pickers involved, the extent that their livelihoods depend on waste-picking, and how waste-picking is organized were unknown.

However, according to the interview, scavengers are no longer seen in the city due to the strict penalties imposed on anyone practicing such activities. The Consultant verified this through the following:

- No scavenging activities were observed during the Consultant's visit.
- According to the interview with WMRA, no scavenging occurs in Sharm El Sheikh.

After interviews and consultations with aforementioned stakeholders, it is apparent that the authorities in Sharm El-Sheikh have been implementing strategies and decisions prior to the publishment of law 202 of 2020 to eliminate scavenging activities. That was noticeably evident by the fact that there were no waste pickers or scrappers seen during the site visit and officials highlighted that it has been a phenomenon that they have been implementing for almost 10 years since they have identified that it has been the main issue in organizing waste management in the City.

The disappearance of waste pickers however is not a result of the current project and therefore does not need to be analyzed further.

3.4 New Planned Interventions

The planned interventions aim at the improvement of the solid waste management environmental and social performance by carrying out the following activities:

Table 9: Project activities and risk identified in the ESMF

Project Activity	Intervention /Bucket of Activity	Risk Identified in ESMF
Activity 1. Install proper working organization of public waste management in Sharm El-Sheikh.	technical assistance	None
Activity 2. Operational improvement of separate waste collection at hotels	technical assistance	They would arise if the Project is directly involved the separation of waste, and consists mainly of occupational health and safety and labour management risks. The risk profile of these activities is analogous to 5.3 above.
Activity 3. Plastic ban and green purchasing guidelines for alternative products	technical assistance to prepare regulations and procedures for banning plastic.	Low

Project Activity	Intervention /Bucket of Activity	Risk Identified in ESMF
Activity 4. Technical assistance for the development of the sorting facility at Wadi Khanassir Activity 5. Check options for best treatment of separate collected organics Activity 6. Monitoring and optimization of further treatment of other waste fractions	The proposed activities 4, 5 and 6 would involve the Project directly in the management of solid waste, including the management of the Al Khanassir waste site. In fact, **the** Project is conceptually tied to the performance of the waste site, because the Project's target reduction in GHG emissions (55 000 tons of CO2 per year, mainly from methane gas and the lost energetic potential of non-recycled waste), and UPOPS releases (6.5 grams of toxic equivalents (TEQ)/year, mainly from the open burning of waste) can only be attained through the improved management of the waste site.	The ESMF couldnt confidently assess the risks of the Project's involvement in solid waste management and how these risks might evolve during Project implementation. As a consequence, and in line with the Project Level Risk Categorization in UNDP's SES, the risk category of the Project's involvement with solid waste management is High.

Table 10: Planned intervention classified by project phase

Activity[19]	Description	Relation to ESIA Scope
Waste Generation		
Activity 1: Plastic ban and green purchasing guidelines for alternative products.	As an additional measure to support the separate waste collection a plastic ban is to be executed: about 1,000 tons annually of plastic waste from land-based sources and boats are to be prevented from being uncontrolled dumped and ending up in the sea. The land-based sources will be eliminated to a large extend by the controlled waste management. Nonetheless, avoiding and replacing of single-use plastic products is necessary, this concerning bags, water bottles, one-way cups, drinking straws, wrapping foils, aside avoiding often giving a chance to replace it by natural, degradable materials. The numerous options are checked for practicability realization, costs and mitigation efficiency. A reduction by 50% seems to be	This initiative will eventually have a positive impact on the waste quantities.

[19] Activity numbers are assigned according to TOR numbering

Activity[19]	Description	Relation to ESIA Scope
	achievable, this mainly determined by the possibility to replace one-way plastic bottles. The project will, in cooperation with the ETFEHA, assess the opportunities to purchase alternative products, e.g. wood-based cutlery, metal straws or paper cups, and elaborate "Green purchase guidelines" to be available online and linked to a catalogue of products and suppliers available. In addition, innovations to optimize the product supply chains through substitution of harmful substances and packaged materials will be elaborated and hotel operators sensitized through the support of the ETFEHA.	
Collection &Transport		
Activity 3: Operational improvement of separate waste collection at hotels.	A group of around 20 hotels/resorts will be selected which are already separating their wastes in a better manner. These hotels will further increase separate collection and will record masses and volumes of the separated fractions over at least one month to get reliable planning data, then provided specifically "per tourist and night". This enables to upscale and estimate future daily volume and mass flows by extension to the other hotels, and for the needed treatment and sorting capacities. Accompanying training of the hotel's staff at source for consequent separate collection and monitoring of volumes and masses will be required. The result of consequent separation and potential GHG emission reduction will be used to advertise the improved collection system to other hotels. The waste operator will secure the complete fraction-separated collection and transport to the sorting/composting/dump site – easy to do since all fractions should be collected in bags which should have different colors following the concerned content. He as well assures the sound treatment of the fractions according to their quality, without littering and open burning.	This will be implemented to improve the quality of collection process at hotels. The activity will include two contributors: • Hotels • New Companies
Treatment of Municipal Solid Waste		
Activity 4: Technical development of	In parallel, the Project will support the optimization of the sorting facility at Wadi Khanasir. The first runs will be observed to detect deficits (operative/technical problems),	The sorting facility upgrade is one of the main activities

Activity[19]	Description	Relation to ESIA Scope
the sorting facility at Wadi Khanasir.	this to eliminate technical deficits and to develop improvement concepts and reconstruct the facility in an early state of the timeline. The performance will be checked for different inputs, esp. for the pre-sorted remaining waste from the 20 hotels and mixed waste from other sources. Special attention will be given to the composting process after hand sorting: Function of the turning machine, water supply, last separation by the compost screen, quality and application of the compost. In addition, the project may provide in-depth waste management training for the Bedouin community managing the Wadi Khanasir area, such as organizing visits to different types recycling factories in Cairo/El Gouna areas.	that will be carried out by the project.
Activity 5: Check options for best treatment of separate collected organics.	Best treatment options of all sorted fractions will be studied and determined. Aside of this, special attention is given to the most relevant separate collectable fraction: Organic waste from esp. kitchen waste and grass clippings, these forming 60-70% of the hotel´s waste. Two ways of composting are possible: (i) Either decentralized composting, directly on the resort's area (as far as locally possible, e.g. as seen at the resort Movenpick) or collection and centralized composting. A good option for centralized composting might be the site of the sewage water treatment – shorter ways than to Wadi Khanasir and water on site available (for remoistening) without its transport. Since the organics are source separated, the produced compost is of very high quality – no doubt this will be a highly desired material to improve the local soils. (ii) Aside, proper treatment of the organics will contribute the highest share of GHG-reduction within waste management, since the methane forming dump siting is eliminated – this being valid for both organic fractions: the separate collected and the one in the remaining waste, being composted at Wadi Khanasir.	Possible alternatives for treatment of separate collected organics have been studied in Section 4.1 and 4.2 of this ESIA.
Monitoring of all MSW Services		

Activity[19]	Description	Relation to ESIA Scope
Activity 2: Install proper working organization of public waste management in Sharm El-Sheikh.	The first activity in the development will be the properly build up and organization of relevant stakeholders. To optimize the collection and treatment process these should be the municipality, the on-site-operator for waste treatment and the EHA. The municipality will act as the general supervisor and enforcement entity and will thereby support qualified performance. Measures should also be taken to halt the dumping of waste on the road from Sharm to Dahab, and to collect small waste landfills scattered around the town by unauthorized waste collectors.	This activity relates to the new collection, treatment and disposal contracts. The municipality will not be involved in waste collection but will act as a general supervision authority. This has been assessed in the alternatives section.
Treatment of Other Types of Waste		
Activity 6: Monitoring and optimization of further treatment of other waste fractions.	A secure storage and treatment concept for hazardous and medical wastes will be developed - first a save storage favourably at an already paved sector of the sorting facility at Wadi Khanasir, then realizing the best options for final treatment of the different fractions (e.g. oil, batteries, chemicals as hazardous waste, autoclave treatment or combustion for medical waste).	As the details of the activities are not yet clear, this activity has not been included in the scope of the ESIA. However, during option analysis, environmental and social criteria should be integrated.

After implementation of the intervention, the project aims at achieving the waste management flow showed in Figure 9: Collection and treatment alternative for hotel waste below.

4 Alternatives

4.1 Alternatives for Hotel Waste Collection and Treatment

4.1.1 Current Waste Stream (No Project Alternative)

The current scenario includes the following:

1. Separating Organic Wastes from the following sources:
   - kitchen waste which is separated at source (organics)-High quality of separation
   - High quality of segregated organic waste stream (small amounts)
   - Primitive hand sorting of the rest of the mixed stream and separating organics
2. Organic wastes collected from all the above are sold directly to the Bedouins to be used as animal feed.
3. Whatever is not sold is sent to the dumpsite (rarely happens).
4. Separating Recyclables after carrying out the primitive hand sorting and sending it to the MBT facility.
5. Recyclables are sent to the MBT facility where it is baled per fraction and transported to Cairo for recycling.

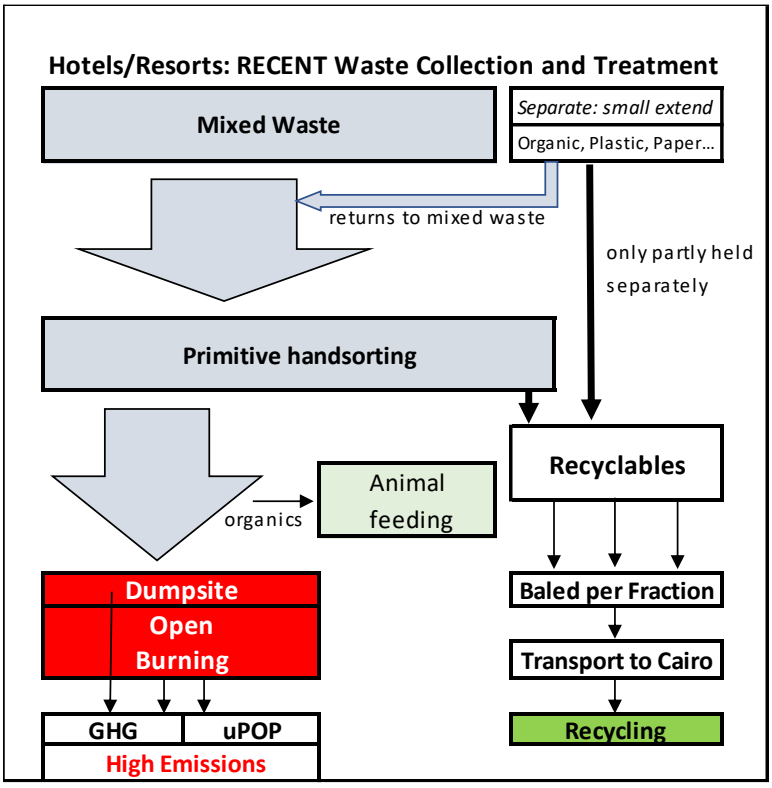

Figure 9: No Project Alternative in Hotel Collection and Treatment

4.1.2 Planned Waste Stream

The planned alternative opts at achieving higher separation at source at hotels, rather than carrying it out using hand sorting. In contrast to the business as usual, the efficiency of high-quality segregated portion is much higher. The different streams are collected using one truck daily but held separately in bags to maintain segregation and are transported to the MBT facility for recycling. Within the MBT facility, the small portion of mixed waste arriving is sorted and added by stream to the readily available separate streams. In this alternative, high quality compost is carried out and the residues are sent to the engineered landfill or to the controlled dump. Other recyclable streams are baled per fraction and transported to Cairo for treatment. This option will result in less GHG.

This scenario will be implemented by:

- Carry out accurate surveys to collect data of masses and the best achievable quality
- Operational improvement of separate waste **collection** at hotels **through Activity 3 described in section 3.4 and** through new Collection Contracts (Annex 3) to ensure accountability

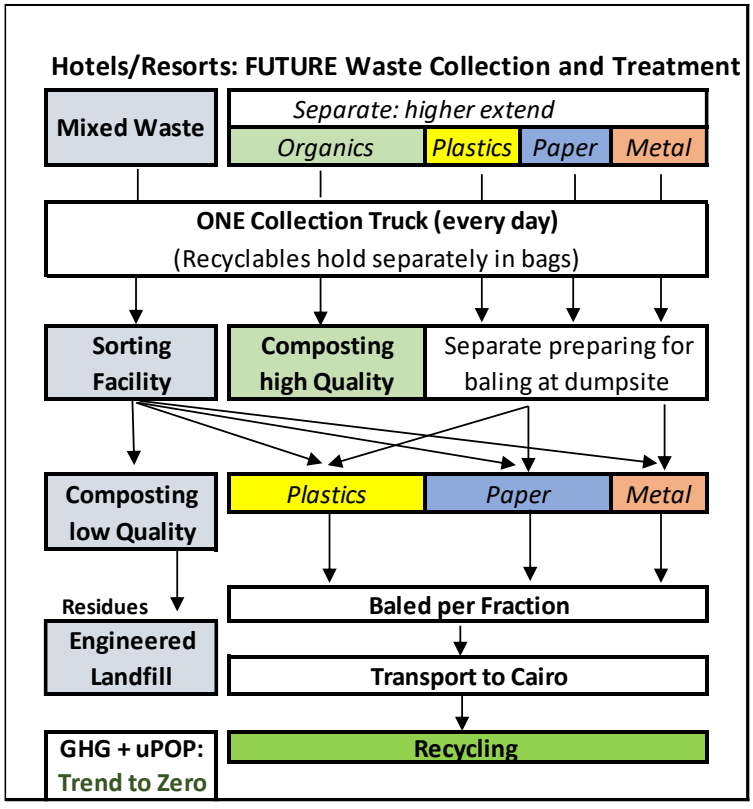

Figure 10: Collection and treatment alternative for hotel waste

4.2 Alternatives for organic waste diversion from landfill (Activity 5: Check options for best treatment of separate collected organics)

4.2.1 High Quality Composting of Organic Waste

Proper treatment of the organics will contribute the highest share of GHG-reduction within waste management, since the methane forming dump siting is eliminated – this being valid for both organic fractions: the separate collected and the one in the remaining waste, being composted at Wadi Khanasir.

4.2.1.1 Decentralized composting

This will include composting directly on the resort's area (as far as locally possible). If this will be carried out, however, it will have to be carried out in a vessel, i.e. in anaerobic conditions as open composting is not permissible by law within residential areas.

4.2.1.2 Collection and centralized composting or Biogas production

Another option for centralized composting could be the site of the sewage water treatment – shorter ways than to Wadi Khanasir and water on site available (for remoistening) without its transport. Since the organics are source separated, the produced compost is of very high quality which will result in a highly desired material to improve the local soils.

4.2.2 Food Waste for Animal Feed

4.2.2.1 Business as usual (Use as animal feed)

The business as usual in organic waste recycling includes the use of the food organic portion from kitchen waste for Bedouin animal feed. While this may not be the best GHG reduction option, implementing a change will impact the livelihoods of the Bedouin Communities who rely on grazing for a living.

4.2.2.2 Use as Animal Feed with Modifications

According to the waste hierarchy, converting food waste into animal feed, is considered the best solution and highest priority after waste elimination and consumption by needy people (at a higher rank than composting, anaerobic digestion to produce biogas, and disposal in landfills)

While food waste has been fed to animals worldwide for centuries, it was banned in the European Union since 2001 due to the fact that feeding of uncooked food waste was associated with the foot-and-mouth disease outbreak as well as pathogen transmission concerns in the United Kingdom and the United States respectively. However, countries such as , Japan, and South Korea have developed tightly regulated policies and invested in substantial infrastructure using adequate thermal processing to promote the conversion of 35–43% of food waste into animal feed

This is therefore the preferred option with possible modifications (such as covered areas for drying) to allow for safe hygienic conversion to animal feed and safe disposal of remains, rather than burning.

Table 11: Options for Diversion of Organic Waste from Landfill

Impact /Aspect	Organic waste for animal feed (No Project)	Organic waste for animal feed (Drying /processing technologies)	Organic waste for biogas production for Bedouin Communities	Organic waste for compost production
Environmental				
Community Livelihood				
OHS/Community H&S				
Technology complexity				
Investment				

Legend

 Low

 Medium

 High

4.3 Alternatives for recyclable fraction

Three options are suggested for the recyclable fraction, namely:

- The Current Situation
- Upgrading the facility's capacity to allow for the handling of the larger quantities of the same sorting and baling activities currently being carried out.
- Introducing new activities to allow for advanced recycling activities to be carried out within Sharm El Sheikh rather than mere baling and sending the recyclables to Cairo.

Table 12: Options for Recyclable fraction

	Current Situation	Expanding the facility's capacity	Recycling within Sharm El Sheikh
Environmental (GHG reduction)			
Community Livelihood	No Impact	No Impact	No Impact
OHS/Community H&S	Comparison NA	Comparison NA	
Technology complexity			
Investment			

Legend

Low

Medium

High

4.4 Alternatives for operational management of waste

4.4.1 Business as Usual

Currently, the solid waste management structure is considered a flat one. Solid waste collection and transport is distributed between private Bedouin companies and the municipality. The private Bedouin companies are the sole responsible entity for treatment and disposal. No supervision is carried out within this structure.

4.4.2 New Structure (Activity 2: Install proper working organization of public waste management in Sharm El-Sheikh)

The first activity in the development will be the properly build up and organization of relevant stakeholders. To optimize the collection and treatment process these should be the municipality and the on-site-operator for waste treatment. The municipality will act as the general supervisor and enforcement entity and will thereby support qualified performance.

This option has already been implemented by hiring the new joint venture company, namely, Bea'h and Green Planet.

5 Baseline data

5.1 Environmental Baseline

5.1.1 Location and Administrative Characteristics of the Area of the Project

Sharm El Sheikhis located at the southern tip of the South Sinai Governorate and is situated along the coast of the Red Sea. Towards the Northwest the city is surrounded by the mountains and landscape of South Sinai. The city can be classified as a narrow coastal city at is positioned at 27° 54' 56.9412" N and 34° 19' 47.8128"E. It functions as the administrative hub of the South Sinai government. The total area of Sharm El Sheikhis estimated at 44.68 km² with an estimated population of 53 658 and a population density of 303.5/km². Other significant areas and towns in the vicinity of Sharm El Sheikh are Dahab, located approx 85 km Northeast, and Al tor located approx. 100 km Northwest of the city. The city retains five different subdistricts/areas these are as followed:

- Nabq
- Ras Nusrani
- Naama Bay
- Umm Sid
- Sharm El Maya.

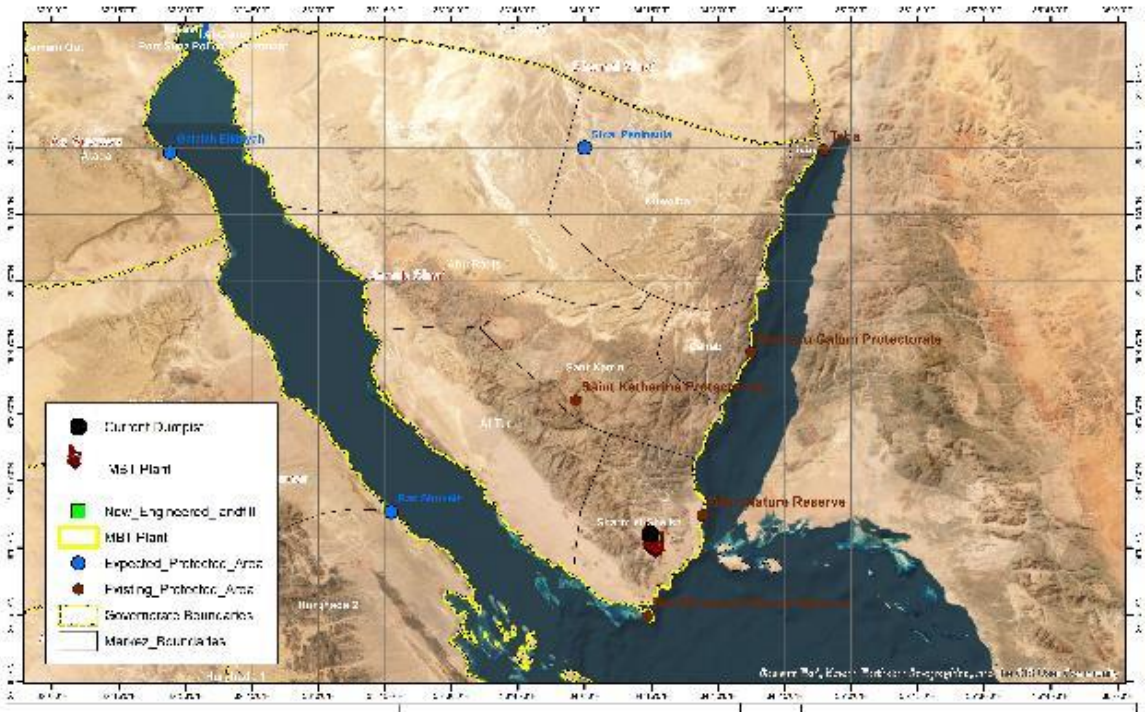

Figure 11: Sharm El Sheikh and surrounding areas

1.5.1 Climatic Conditions

Sharm El Sheikhis situated in an area of extreme aridity and possesses a subtropical desert climate based upon the köppen-Geiger climate classification. It has scarce rainfall averaging at approximately 25mm/year however, flash flooding events occasionally occur due to heavy rainfall (Yousif & Hussien 2020). The average monthly daily temperature ranges between 17 °C in January and can rise to 32 °C in August. The relative humidity ranges between 32 % in July and 48% in December (Khatita et al. 2014).

A predominant northern wind is present in the area of Sharm El Sheikh. This meteorological condition is constituted by the Bay of Aqaba as well as the mountains of Sinai. During the summer dry and hot climatic conditions are caused by the winds originating from the north-northeast. The winter season is characterized by winds from the south. The Khamasian (westerly wind) that can occur in both the spring and autumn season and cause the strong dust winds. Generally, windspeeds to not reach over 20 knots and the wind direction mostly originates from N-NNW and S (Khatita et al. 2014; Embabi 2017; Mohamed et al. 2007)

Table 13: mean annual air Temperature (˚C) S: mean annual wind speed (km/h) SH: mean annual sun shine (%) CP: mean annual cumulative precipitation (mm) RH: mean annual relative humidity (%) (Ahmed & Sadek 2015)

Weather Station	T (˚C)	S (km/h)	SH (%)	CP (mm)	RH (%)
Sharm El Sheikh	25.16	13.37	95.63	60.3	45.16

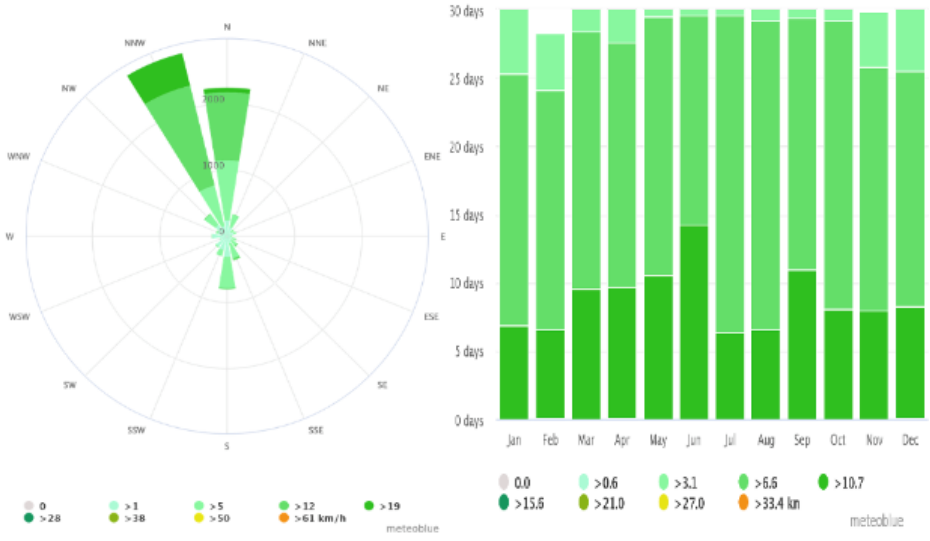

Figure 12: Figure 11. Left: Direction of where wind originates Right: Monthly and daily wind strength in Sharm El Sheikh

5.1.2 Climate Change

Study findings of data analysis for temperature and rainfall from 1995 to 2014, suggest that the region is experiencing a shift towards a hotter and drier climate, which causes unpredictable rainfall patterns. The projections in mean temperatures in South Sinai are shown in the Figure below.

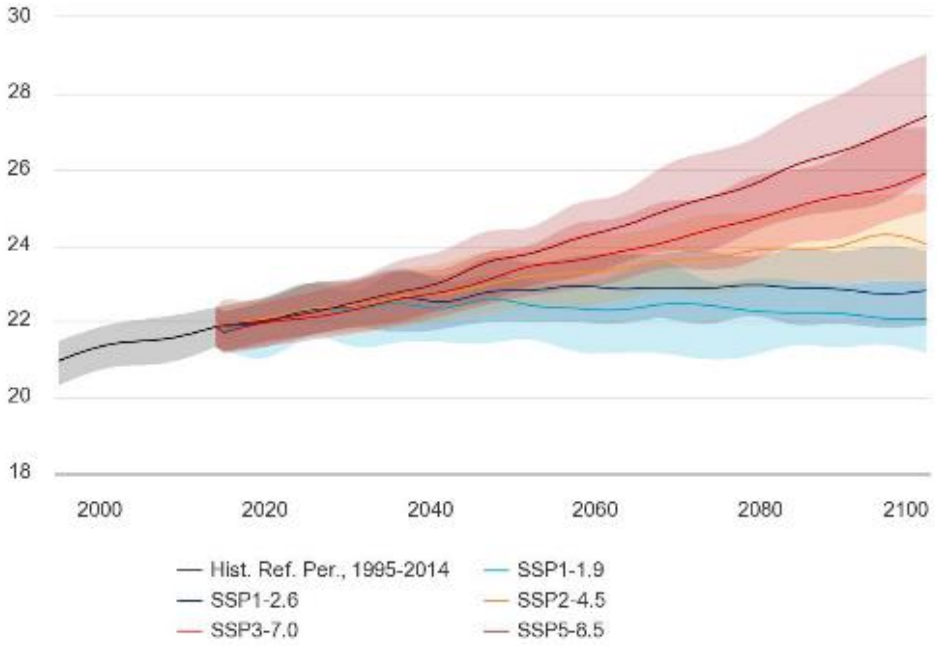

Figure 13:Projected Mean Temperature in South Sinai[20]

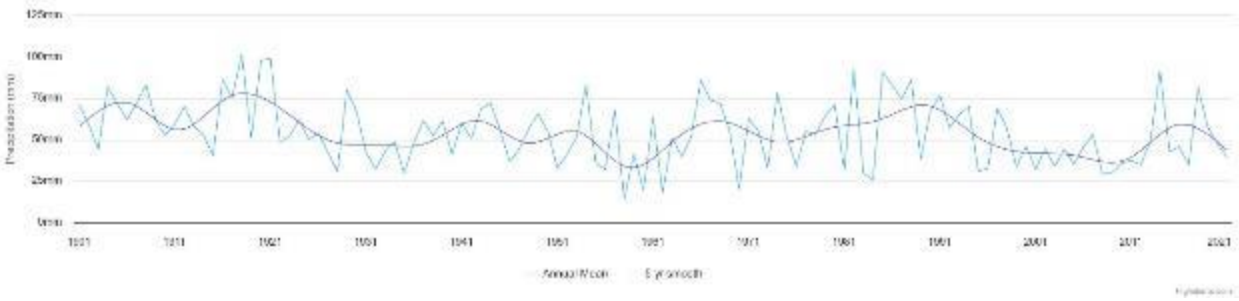

Figure 14: Observed Average Annual Precipitation of South Sinai, 1901-2021

[20] https://climateknowledgeportal.worldbank.org/country/egypt/climate-data-projections

5.1.3 Air Quality in Sharm El Sheikh

According to AQAir, **PM2.5 concentration** in Sharm el-Sheikh is currently 2.4 times the WHO annual air quality guideline value. It should be noted however, that these values may change by season due to the desert nature of the land.

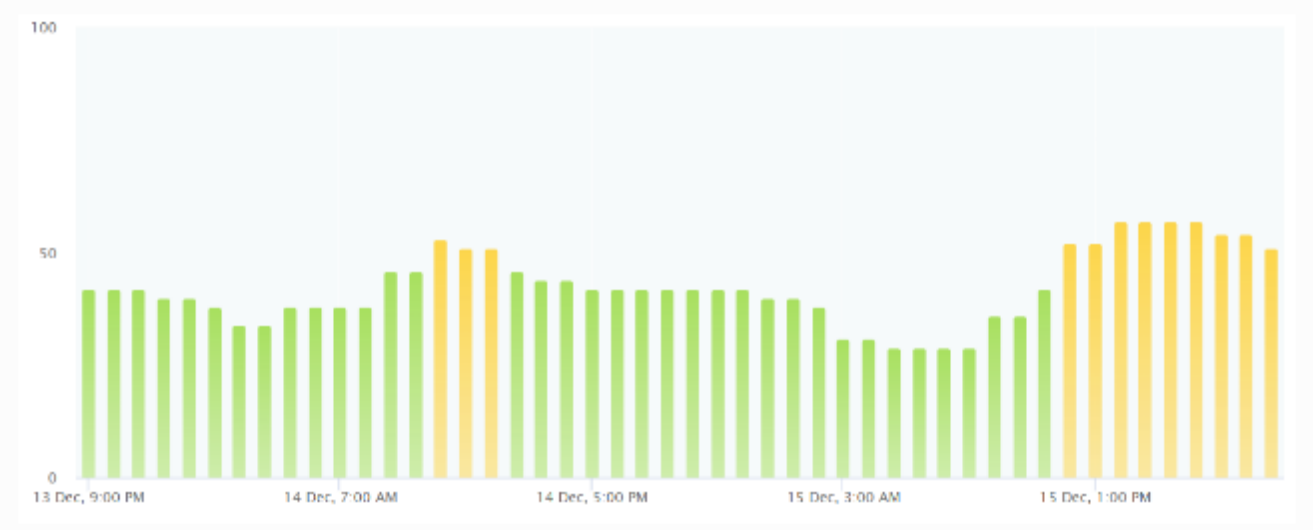

Figure 15: Air Quality Index in Sharm El Sheikh[21]

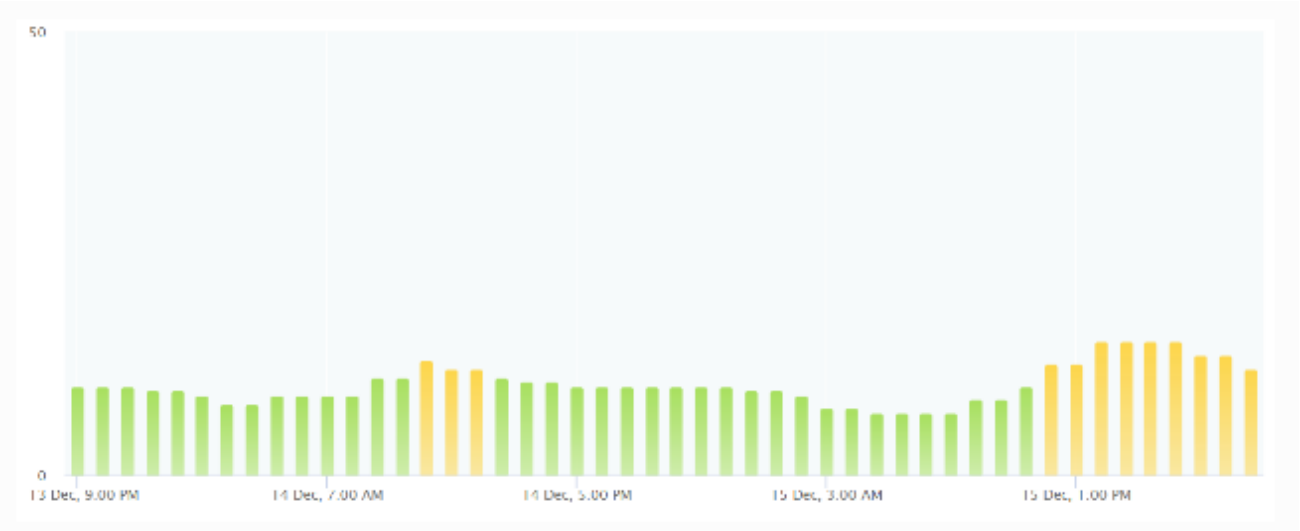

Figure 16: PM2.5 air pollution in Sharm el-Sheikh

5.1.4 Geology

The morphology of Sharm El Sheikh is extremely diverse. Surrounding it from the east is the Gulf of Aqaba. Towards the West the area is surrounded by significant areas including Gabel Um Tartir, Gabel

[21] https://www.iqair.com/egypt/south-sinai/sharm-el-sheikh

Qaida, Gabel Watr, and Gabel El-Safra. The area is characterized by a diverse presence of different sedimentary elements including Precambrian granitic rocks, Cretaceous Nubian sandstones, Pleistocene coral reefs, and Quaternary sediments.

To constitute a certain overview the geological setting in Sharm El Sheikhcan also be divided into two main areas. The earlier stage of the Miocene and Pliocene age introduced recent sedimentary rocks. The second part is made up of suites of granites from the Precambrian plutonic suites. These Precambrian suites can form four different and distinctive Igneous intrusions, also named plutons, these are: The El-Att El-Sharqi monzo-syenogranite, Madsus syeno-alkali feldspar granite, Sharm alkali feldspar granite and Umm Adawi-Sahara riebeckite-bearing granite.

The geological units that are exposed in the area of Sharm El Sheikhare mainly the igneous and sedimentary rocks, Pliocene Reefal Limestone and Lower Miocene alternate beds of sandstone and marls. The holocene surfacial Wadi deposits of sand and gravel are classified as the youngest units. Located in the western area of Sharm El Sheikhrocks of Quartz Syenite and Granite can be found, these stem from the Late Proterozoic time.

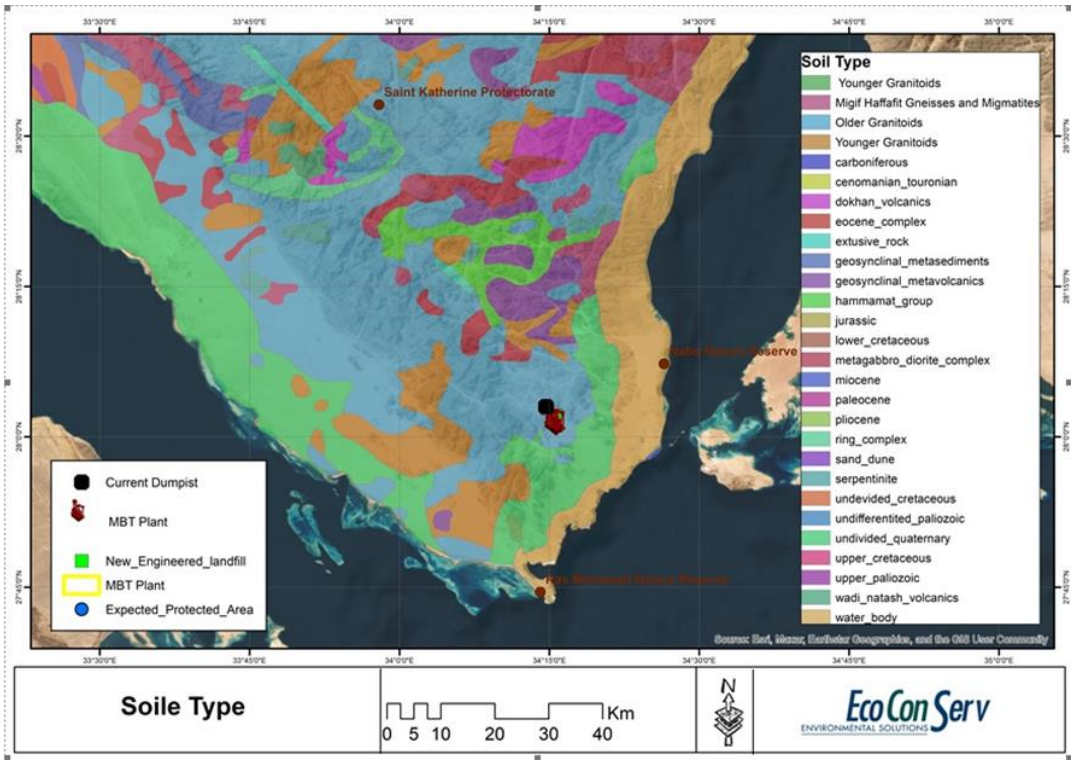

Figure 17: Geological map of South Sinai

5.1.5 Seismic activity

On November 19th, 2011, and In 2020 on June 16th earthquakes with the moderate magnitude of (Mw= 4,6, 2011) (Mw=5.2, 2020) hit multiple cities and the overall region of the Northern Red Sea. These occurrences were also felt in the city of Sharm El Sheikhbut caused no sever damages. Multiple regions in Egypt are susceptible to earthquake. These include the regions of the Northern Red Sea, Gulf of Aqaba, Gulf of Suez, Cairo-Suez district, Southwest of Greater Cairo (Dahshour area), and in the Eastern Mediterranean region, as well as the low seismic activities on the central and southern parts of Egypt. Historically there are two significant Earthquake events in Egypt including the Shadwan earthquake (Mb = 6, 1969) and Aqaba earthquake, (Mw = 7,3 - 1995). One of the most seismic active areas in Egypt lies in the vicinity of the southern part of the Gulf of Suez. Historical research on the distribution of recent earthquakes in this region, illustrate that a concentration of activity exists along the southern end of the Gulf of Suez. This activity concentration takes place near the junction of the Gulf of Suez and the Northern Red Sea. This activity is due to the adjustments taking place at the triple junction between the African plate, Arabian plate and Sinai microplate (Youssef et al. 2009; Sherif et al. 2013)

Historically the northern Red Sea was connected to the Mediterranean, but overtime detached. Present times indicate that the Red Sea has two northward extensions, these include the Levant rifts and the Suez rift. The Suez rift's directing trend is northwestwards, causing the western margin of the Red Sea to merge with the western boundary of the Suez Rift.

In closing, the area of Sharm El Sheikhis under tectonic stress resulting from the Red Sea lateral spreading of approximately 2 cm per year. The intensity of the potential Earthquakes range between 3 and 4 on the Richter seismic Magnitude scale.

5.1.6 Groundwater in Sharm El Sheikh

Sharm El Sheikhis located in the arid region of the South Sinai Peninsula. The area is prone to scarce rainfall and insufficient groundwater to meet its social and economic development. The main supply of freshwater utilized by resorts and hotels stems from water desalination. The quality of the groundwater has been prone to degradation. This occurrence is caused by multiple factors including high pumping rates, disposal of rejected brine water back into the aquifer, and seawater intrusion. The Miocene aquifer functions as the main source of freshwater and is affected by a high salinity and desalination. 54 reverse osmosis plants are located in Sharm El Sheikh, two different sources are responsible for supply. Seawater is retrieved directly from the Gulf of Aqaba and from deep drilled groundwater wells that tap from the Miocene aquifer. The depth of the wells that tap and utilize the Miocene groundwater range between 30 to 100m. The water capacity of the desalination plants in Sharm El Sheikh exceeds 64, 000 m^3 per day (Khatita et al. 2014; Yousif & Hussein 2020)

Table 14: Groundwater and water supply in Sharm El Sheikh

Method	Owners	Recipients	Capacity	Amount
Reverse Osmosis Desalination plant	Government operated/owned	Local Residents & public buildings	9,000 m 3 /day	2 plants
Reverse Osmosis Plants	Private (Hotels)	Hotels & Resorts	30,000 m 3 /day	50 plants
Reverse Osmosis Plants	Private companies	Hotels that do not possess RO plant	24,000 m 3 /day	2 plants
Accessed and piped groundwater (Distance 100km)	Area of Al tor	Public	7,800 m 3 /day.	
Water truck (Distance 100km)	Area of Al Tor	Public	2,000 m 3 /day.	

5.1.7 Biodiversity

The landfill and transfer station site location is within mountainous areas surrounded by desert areas, at a distance of 18 Km from the Coast. No threatened species were observed within the direct project area. The only species observed are stray dogs. Pests such as flies were also observed during the site visit.

The following paragraphs describe the various flora and fauna in and around the area of Sharm El Sheikh. National parks and protectorates are an essential part of the area and are rich and diverse in respect to their biodiversity.

Storks (Ciconia Ciconia) and migratory birds

Thousands of migratory birds and many Palaerctic species annually traverse within the south sinai region, including Sharm El Sheikh. Approximately 272 different species of birds can be observed in the area of Sharm El Sheikh, 8 of these species are considered to be categorized as globally threatened.

South Sinai's positioning constitutes an important and detrimental role for migratory birds and other Palearctic species. The white stork for example utilizes Sharm El Sheikhas an immensely important

passage area. During the spring and autumn migration cross this area on its passage to East and Southeast Africa can be observed. Storks can be seen in the urban areas of Sharm El Sheikhas well as the national park of Ras Mohammed. They face a high mortality rate partly due to anthropogenic disturbances including touristic activities (quad drivers), hunters and threats that include sewage, garbage or overhead lines (Schimkat, 2013).

Coral Reefs

The northern Red Sea functions as one of the major centers of global marine biodiversity. It supports around 1,248 species of fishes, representing 157 families. 17 % of the existing and globally recognized fish species are located in this area. The commercial and economic importance of these fishes are immense. They simultaneously function as touristic endeavor as well as an important component of the Egyptian economy and food system.

It is to be stated that coral reefs are one of the most important ecosystems and are also considered to be the most biodiverse ecosystems of the ocean. Spatially they only represent 0,2 % of the marine environment. However, they are home to one third of all described and known marine species. They are also among the most heavily affected and degraded marine ecosystems, due to a number of anthropogenic and natural occurrences. The reefs in the area of Sharm El Sheikhdeveloped in last postglacial period. The Reefs on the Gulf of Aqaba are diverse and consist of 110 species of hermatypic corals and approximately 120 species of soft corals. These corals play a detrimental role in facilitating a viable home for many species of fish. The most predominant reef type in the area is the fringing reef that is present throughout the Gulf of Aqaba (Hawkins & Roberts 1993; Kochzius 2002; Branchini 2014)

Protectorates near Sharm El Sheikh

To provide and ensure the protection of natural resources and biodiversity, and to maintain the environmental balance, the concept of natural protectorates was implemented. To protect those resources, the Prime Minister issued Law No. 102/1983 for Nature Protectorates and then Law No. 4/1994, the Environmental Protection Law to support the provisions mentioned in Law No. 102/1983.

Natural Protectorate is defined as any area of land or coastal or inner water, which is characterized by its content of organisms including flora, fauna, fish, or natural phenomena with cultural, scientific, touristic, or aesthetic value. There are three substantial protectorates in the near vicinity and around the Sharm El Sheikh area. The three areas in and around Sharm El Sheikh all indicate a crucial and immense biodiversity. The areas are also responsible for being the habitats of many endangered and indigenous floras and faunas.

Ras Mohammed National Park

The Ras Mohammed National Park is Egypt's first national park and was established in 1983. The size of the national park is approximately 836 Km2 (land portion: 239 km^2; marine portion: 597 km^2) and

is located and the most southern tip of the peninsula, it is located 12km south of Sharm El Sheikh. The Egyptian government placed the responsibility of the management of the park to the EEAA (Egyptian Environmental Affairs Agency), in 1988. The park surrounded by the Gulf of Suez and by the Gulf of Aqaba. The biodiversity and presence of fauna is immense. The area includes over 1,000 fish, 40 starfishes, 150 species of crustaceans and 25 species of sea urchins. the area is home to three different endangered marine turtles including the Green turtle (***Chelonia mydas)***, logger head turtle (***Caretta caretta)*** and hawksbill turtles (***Eretmochelys imbricata)***. The area is also home to the endangered white stork, as well as an abundance of Littoral habitats These include mangrove Avicennia marina community, salt marshes, intertidal flats and seagrass beds (EEAA 2007).

Naqb Nature Reserve

This protectorate is located approximately 25 km north of Sharm El Sheikh. With 586.5 km² in size (land portion: 464.6 km²; marine portion: 121.9 km²) in size it is the largest coastal park in the region. The terrain of the area is characterized by high mountain chains and a high mangrove presence. The area plays host to the largest mangrove population in the Gulf of Aqaba. These trees play an essential role for the habitat of an abundance of small water species and crustaceans/ furthermore they also function as vital habitats and nestling locations for other fauna including birds. The area contains 134 plants with 6 being endemic this area. The adjacent desert of the protectorate is home to an abundance of fauna including Ibex, Hyrax. The area also functions as a vital breeding ground for the Ubian Heron, Spoonbill and Osprey (SIS.GOV)

Abu Galoum PA

Abu Galum covers an area of 500 km², and was declared as a protectorate in 1992. The importance of this area comes from its variety of coral reefs that are unlike anywhere else in the world. It also features the Blue Lagoon, a natural saltwater pool surrounded by climbable mountaintops. Because of its unique terrain, the protected area offers habitat to a wide range of wildlife animals, including foxes, vultures, and ibexes. The surrounding mountains are also home to various other reptile, bird, and fish species such as the Sinai Agama, Grey Heron and the Giant Moray Eel.[22]

St. Catherine Protectorate

This site is categorized as one the most important natural protectorates in Egypt. It is also home to the St Catherine world heritage site as well as the country's highest mountains and spans over an area of 4250km2. The area supports an extensive biodiversity and an increased number of endemic species. The endemic fauna is largely found together with relict species ranging from Sinai rosefind (Carpodacus synoicus), ibex (capra nubiana) and the canis lupus and stiped heyna (Hyaena) the tristam's grackle (Onychognathus trsitramii. The protectorate also encompasses an important bird area. Two third of egypts insects including two-thirds of Egypts butterflies are present here. Two

[22] https://ecoegypt.org/abu-galum/

endemic species are also to be accounted for, including the tiny Sinai baton blue (Pseudophilotes sinaicus). There are 27 species of reptiles such as serpents, vipro dablizards, monitor lizards, and snakes etc. The Area also has 22-28 species that exist only in Sinai including the, samm, Habaq, sorrel wood, thyme, worm wood, buck thorn, tarfa, sakaraan, Ba'ataran and other medical and poisonous plants (Grainger & Gilbert, 2008).

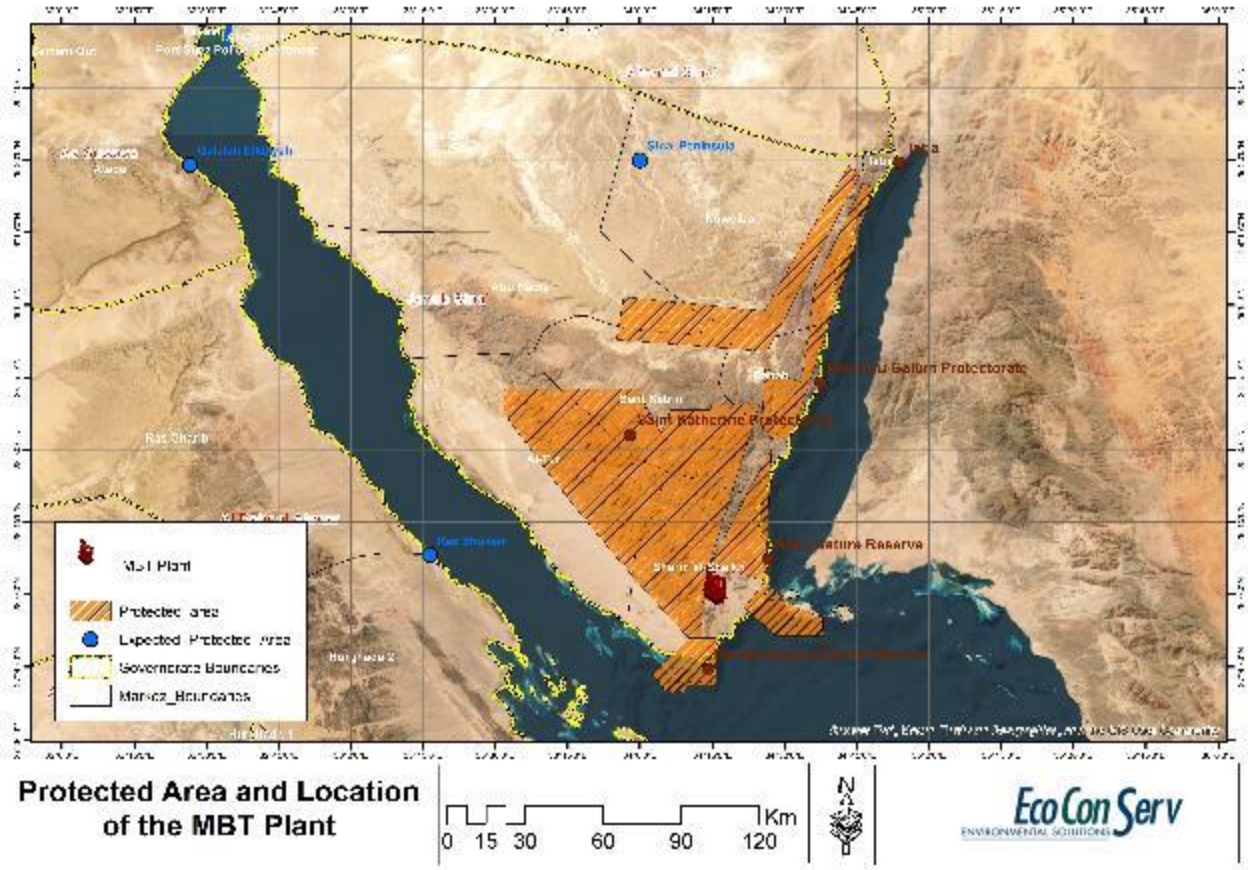

Figure 18 : Three protectorates and their borders.

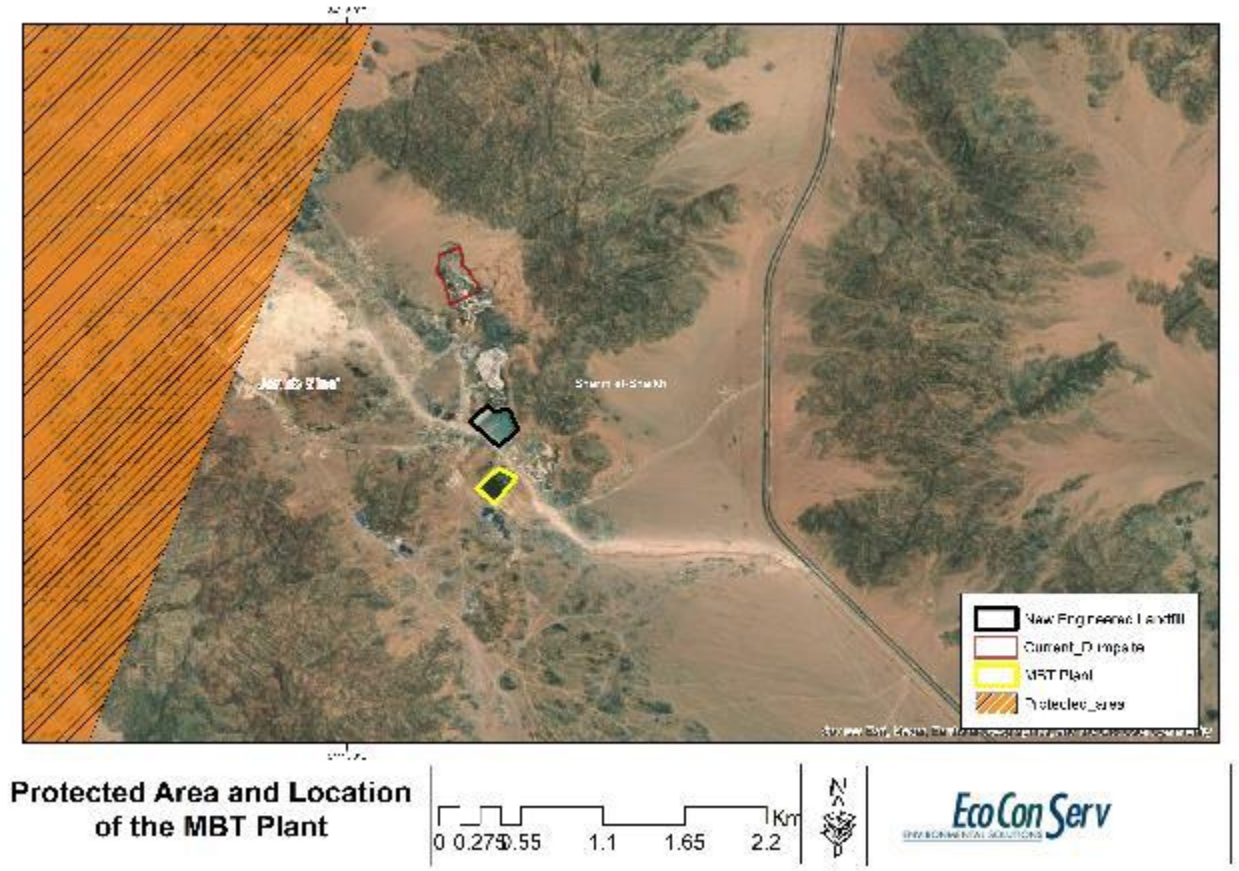

Figure 19 : Project Area from protectorates boundaries.

Table 15: List of Aves species in the protectorate St. Catherine (near facility)

Species	Current IUCN Red List Category	Season	Population estimate
Sand Partridge Ammoperdix heyi	LC	resident	present
Crowned Sandgrouse Pterocles coronatus	LC	resident	present
Lichtenstein's Sandgrouse Pterocles lichtensteinii	LC	resident	present
Desert Tawny Owl Strix hadorami	LC	resident	present
Pharaoh Eagle-owl Bubo ascalaphus	LC	resident	present

Sooty Falcon Falco concolor	VU	breeding	present
Greater Hoopoe-lark Alaemon alaudipes	LC	resident	present
Desert Lark Ammomanes deserti	LC	resident	present
Pale Rock Martin Ptyonoprogne obsoleta	LC	resident	present
Streaked Scrub-warbler Scotocerca inquieta	LC	resident	present
Tristram's Starling Onychognathus tristramii	LC	resident	present
Hooded Wheatear Oenanthe monacha	LC	resident	present
Blackstart Oenanthe melanura	LC	resident	present
White-crowned Wheatear Oenanthe leucopyga	LC	resident	present
Oenanthe lugens	NR	resident	present
Trumpeter Finch Bucanetes githagineus	LC	resident	present

5.2 Social Baseline

5.2.1 General Background

Figure 20: South Sinai Governorate Map

South Sinai Governorate was established as an independent governorate of North Sinai, with Sinai as its capital, by Presidential Decree No. 84 of 1979. In March 1982, Prime Minister Decree No. 175 was issued dividing South Sinai Governorate into eight cities.

It is one of the governorates of Egypt and one of the two Sinai Peninsula governorates. The city of Al-Tur enjoys a stable atmosphere throughout the year and has pure water sources from the artesian wells. This makes it distinct from all the governorate cities in which the presence of fresh drinking water is rare.

South Sinai has a lot of touristic attractions, with impressive beaches spanning about 600 km on both the Gulf of Aqaba and Suez Gulf. There are mountain ranges that are known as Egypt's most elevated mountains as well as natural reserves such as Ras Mohammed and Nabq.

Sharm el-Sheikh is an Egyptian tourist city located at the Gulf of Aqaba and Suez Gulf intersection on the Red Sea coast. With an area of 480 km, with a population of 35 thousand, it is considered to be South Sinai Governorate's largest city with tourist resorts frequented by visitors from all over the world. Popular as one of the world's diving centers attracting amateurs and sports professionals, it also includes an international airport. Its most important areas are Ras Nasrani, Ras Umm Syed, Ras

Jameela Al-Mayyah Church, Sharm el-Maya, Tibel Palm, along with the Ras Mohammed Reserve in the south and the Nabaq Reserve between Sharm el-Sheikh and Dahab.

Sharm el-Sheikh International Airport

Figure 21: Sharm el-Sheikh Airport

Sharm el-Sheikh International Airport is an international airport 23 km from Sharm el-Sheikh city, formerly known as Al-Afira International Airport, one of Egypt's largest tourist airports. It was operated by the Egyptian Civil Aviation Authority (currently the Ministry of Civil Aviation) after the retrieval of the rest of the occupied Sinai territories in April 1982 for civilian administration. It had a simple preconstructed building divided into a travel terminal and an arrival terminal, each accommodating 150 passengers per hour, and the installation of a 4 medium aircrafts runway. The airport currently has 2 terminals with a third one expected to open in 2025.

Sharm el-Sheikh Sea Port

The port of Sharm el-Sheikh is one of the Egyptian ports under the General Authority for Red Sea ports, located on the Red Sea coast in the far south of the Sinai Peninsula at the Gulf of Suez and Aqaba junction at the head of the southern triangle represented by the Sinai Peninsula 156 nautical miles from the port of Suez, 380 km south of Suez.

South Sinai tribes and their location

In the city of Sharm El-Sheikh, there are the Mezaina and Tahrir tribes, and they are located in the areas of (Ruwaisat - Khreiza - Mandar) in Sharm El-Sheikh.

Figure22 : Mezaina Tribe

5.2.2 Desktop Review and Secondary Data

5.2.2.1 Location

Sharm El Sheikh commonly abbreviated to Sharm, is an Egyptian city on the southern tip of the Sinai Peninsula, in South Sinai Governorate, on the coastal strip along the Red Sea. Its population is approximately 53,670 as of 2022. Sharm El Sheikh is the administrative hub of Egypt's South Sinai Governorate, which includes the smaller coastal towns of Dahab and Nuweiba as well as the mountainous interior, St. Catherine and Mount Sinai. The city and holiday attraction is a significant center for tourism in Egypt, while also attracting many international conferences and diplomatic meetings most recently the World Youth Forum that has been hosted for 4 editions and most recently COP 27. Sharm El Sheikh is one of the Asian cities of Egypt, it's also called (The city of peace).

5.2.2.2 Administrative Division

The governorate of South Sinai is divided into nine cities with nine local units:

1. Ras Sidr
2. Abu Zenima

3. Abu Rudeis
4. Tur Sinai
5. Sharm El Sheikh
6. Saint Catherine
7. Nuweiba
8. Dahab
9. Taba

Sharm el-Sheikh city has been subdivided into five areas, namely Nabq Bay, Ras Nasrani, Naama Bay, Umm Sid, and Sharm El Maya. Together with Hay el Nour, Hadaba, Rowaysat, Montazah and Shark's Bay, it forms a metropolitan area of 42 square kilometers.

5.2.3 Demographic Characteristics

5.2.3.1 Population

Table16 : Number of population - households - public housing - number of individuals living in Sharm El Sheikh

City / Village	Total Population			Number of Households			Number of family members	Number of public residencies	Number of people living in them		
	Males	Females	Total	males	Females	Total	Total	Total	Males	Females	Total
um Sid Area	2495	2126	4621	1233	2486	2116	4602	29	9	10	19
Sharm El Mia Area	64	64	128	28	64	64	128	0	0	0	0
Hayy Al Nour Area	2131	1980	4111	1101	2130	1978	4108	18	1	2	3
Naama Bay Area	582	440	1022	276	579	440	1019	9	3	0	3
North Naama Area	191	170	361	159	191	170	361	1	0	0	0
Wadi Ruwaisat	1483	1149	2632	726	1483	1149	2632	2	0	0	0
Wadi Al Atat Gathering	4	3	7	3	4	3	7	0	0	0	0

City / Village	Total Population			Number of Households			Number of family members	Number of public residencies	Number of people living in them		
Wadi Awaja Gathering	43	45	88	20	43	45	88	0	0	0	0
Wadi Alkhrum Gathering	30	27	57	18	30	27	57	0	0	0	0
Wadi Jadla Gathering	9	10	19	5	9	10	19	0	0	0	0
Wadi Al-Khanaseer Gathering	26	26	52	16	26	26	52	0	0	0	0
Wadi Al-Nahij Gathering	37	47	84	15	37	47	84	0	0	0	0
Wadi Alkid Gathering	10	9	19	8	10	9	19	0	0	0	0
Rural sentence	7105	6096	13201	3608	7092	6084	13176	59	13	12	25

Inter section first Sharm El Sheikh	7105	6096	13201	3608	7092	6084	13176	59	13	12	25
Second section Sharm El Sheikh											
Nabq District	267	203	470	177	267	202	469	14	0	1	1
Urban sentence	267	203	470	177	267	202	469	14	0	1	1
Sbeita	44	36	80	22	44	36	80	0	0	0	0
Wadi Mandar	118	134	252	65	118	134	252	0	0	0	0
Eastern Shorafa	188	152	340	65	188	152	340	0	0	0	0
Western Shorafa	49	55	104	27	49	55	104	0	0	0	0
drowning	25	20	45	16	25	20	45	0	0	0	0
Khriza	35	33	68	20	35	33	68	0	0	0	0
Camel Burner	36	42	78	14	36	42	78	0	0	0	0

Wadi Marsa Braika	2	2	4	4	2	2	4	0	0	0	0
Rural sentence	497	474	971	233	497	474	971	0	0	0	0
Sentence second section Sharm El Sheikh	764	677	1441	410	764	676	1440	14	0	1	1

Source: Central Agency for Public Mobilization and Statistics (CAPMAS), Census 2017

5.2.4 Infrastructure

5.2.4.1 Electricity

The governorate is spending EGP 461.2 mn, which is the total cost of implementing a number of projects amounting to 25 electricity projects in the governorate within 6 years, which serve all cities and community partners, including residents, government agencies and private sectors. The governorate is targeting EGP 316.6 mn, which is the estimated cost of implementing 14 electricity projects in the governorate, through which the governorate intends to develop its infrastructure in preparation for any increase in sectors, projects and population.

The most prominent electricity projects that have been implemented at a cost of EGP 310 mn are:

- Connecting the electric current to King Salman University, Tur Sinai branch
- Cultural Museum in Sharm El Sheikh
- Water and drainage stations in the governorate
- Social housing units
- Connecting Saint Catherine and Wadi Ferran to the unified national grid at a cost of EGP 35 mn
- Plans to replace, renovate and expand electricity networks in the governorate at a cost of EGP 26 mn

5.2.5 Water

5.2.5.1 Drinking water

Sharm el-Sheikh is in a very dry area with no nearby source of fresh water, 2008 data shows the following water sources:

Two government-owned reverse osmosis desalination plants with a total capacity of 9,000 m^3 per day sell water to locals and public buildings at a very low subsidized price.

About 50 private reverse osmosis plants owned by hotels produce about 30,000 m^3 /day

Two privately operated central reverse osmosis plants with a total capacity of 24,000 m^3/day Water For hotels that do not have their own desalination plants, or cannot meet their needs, the two operators of these plants charge commercial prices and significantly raise prices during the summer when demand is highest.

Piped groundwater from the phase (100 km) contributes about 7800 m^3 / day.

Water transferred from the phase contributes about 2000 m^3 / day.

The above analysis shows that the demand for water and its use in hotels is much higher than for city dwellers and residents of neighboring rural areas, reverse osmosis plants can meet the overall demand but require a large amount of electricity obtained from the grid and discharge of brine into the environment.

The sector aims to provide drinking water and sanitation services with the required specifications for the population, as well as the delivery of water and sewage services to all development activities while improving the level of service, spreading health awareness and following a parallel price policy

between burdening citizens, recovering the cost and rationalizing water consumption The main policies of the sector are as follows:

- Reaching 100% water and sanitation services to all regions
- Reuse and utilization of wastewater in irrigation for green spaces and agriculture, taking into account health requirements
- Maintaining the current production capacity of water and maintaining its quality and conformity with specifications through an integrated program for replacement, renewal, operation, maintenance and quality control
- Expanding training programs to raise the level of efficiency of administrative and technical capabilities of workers in the sector and upgrading the level of service of the drinking water and sanitation sector
- Spreading environmental awareness of the importance of rationalizing water use and developing the sanitary devices industry to reduce water losses, future needs and energies required for 2017
- The quantities of water required in 2017 are estimated at 244.650 (thousand m3 / day) and therefore the required expansions are estimated at 119.785 (thousand m3 / day)

Figure 23: The use of drinking water for Bedouins in the desert through the tank available from the governorate

5.2.5.2 Water Resources and Irrigation

Agriculture in South Sinai Governorate depends on groundwater and the the total area of cultivated land in the governorate has reached 31,000 feddans as of 2021.

- 760 feddans of the integrated development project for the people of Sinai in the valleys with 14 communities worth EGP 123 Mn
- 925 greenhouses were provided by the armed forces and seeds and seedlings are provided free of charge to farmers
- 265 new wells were drilled in different valleys

The most important projects under implementation:

- 7 development clusters are under construction at a total cost of $ 65 million on an area of 5510 acres
- 180 million costs of establishing an integrated services center for agricultural development

The most important agricultural crops in the governorate:

- Fruits and vegetables in the Wadi Ferran and Saint Catherine area
- Palm trees on the coast of the Gulf of Suez and Aqaba, the most important of which are surrounding the city of Tur Sinai
- Field crops such as wheat and barley, oil crops such as safflower, fodder crops such as alfalfa, fodder cowpea, and dairy crops such as sisal

5.2.6 Sanitation

Municipal wastewater is collected through the public sewage system (65 km) to 15 pumping stations, and then to the government-owned wastewater treatment plant capable of treating 15,000 ^{m3} / day.

There is also one special central treatment plant with a capacity of 6000 m3/day, about 50 decentralized wastewater treatment plants in hotels with a total capacity of approximately 20,000 m3/day. The plants comply with Category 1 of Decree No. 44/2000 regulating the use of treated wastewater for irrigation purposes. Category 1 wastewater treatment plants have the highest level of treatment including secondary treatment, sand filtration and disinfection (tertiary treatment).

Treated wastewater is used to irrigate landscapes and golf courses. Wastewater is recycled and used mainly to irrigate green spaces, green belts and foresttrees in the city.

The required expansions of the governorate's sewage systems in 2017 are estimated at 134.52 (Elf m3/ day).

5.2.7 Agriculture and reclamation Lands

Agriculture is one of the main pillars of development on the land of the governorate The cultivated area of farmers is about 32981 thousand acres concentrated in the area of the bottom plain in the city of Tur Sinai alone approximately 100 thousand acres have been allocated 20 thousand acres within the presidential national project 1.5 million acres, depending on the groundwater in this region. The most famous crops that are found in the province Olives Figs Palm Grapes Pomegranate Wheat Barley All kinds of vegetable crops.

The area of arable land in South Sinai Governorate is estimated at about 200,000 acres, while the area currently cultivated by the people of the governorate and around the wells is mostly fruit gardens in the areas of Saint Catherine and Wadi Ferran. South Sinai Governorate is characterized by the presence of wild plants that are used in the treatment of some diseases and the area east of the canal and the Gulf of Aqaba of the areas that have an important agricultural future in South Sinai, and agriculture depends on the preservation of groundwater and the total wells (government / people) about 1000 wells The total area planted with wheat is 1010 acres in 2019, and the total

area planted with olives this year amounted to 18 thousand acres, and the city of Ras Sidr accounts for the lion's share, with a total of 16 thousand acres and the share of Al-Tur 2000 acres of olive cultivation area. The city has become a producer of vital crops of vegetables and fruits and depends on the consumption of what it cultivates after it was waiting for the arrival of vegetables and fruits from neighboring governorates such as Ismailia, Suez and Cairo at high prices due to the addition of transportation expenses. The goal of the agricultural development project in the middle of the desert is to establish small urban communities that can be developed in valleys by exploiting the available wells to create an integrated agricultural community that includes dense fish farms, greenhouses, open vegetable cultivation, fruit trees, palm cultivation, as well as sheep breeding. And goats are also using solar energy if necessary and all the activities of these projects exploit the water resulting from fish farming in the irrigation of other crops and all of them are linked to drip irrigation networks and that the integrated development project for the people of the south. The city of Tur Sinai is the only one that is suitable for the cultivation of palm dates scheduled, which failed to experiment in some governorates such as Ismailia and the governorates of the Delta and the desert, and that this type of dates is required to be exported.

5.2.8 Roads and Transportation

The city of Sharm El-Sheikh connects the rest of Egypt to the west by the Suez-Sharm El-Sheikh road, reaching Cairo with a length of more than 500 km, by passing through the tunnel of the martyr Ahmed Hamdi under the Suez Canal, and because of the lack of dualization of this road starting from the tunnel to Sharm El-Sheikh with a length of 360 km, many traffic accidents occurred, which called the Egyptian government To launch the road dualization project in several stages, the first phase of which is the distance between the tunnel and the city of Ras Sidr with a length of about 60 km, at a cost of more than EGP 100 million, and connects the city to the east with the Sharm El Sheikh - Taba road with a length of 240 km, which is also a one-lane road, and launched a project to double the distance between Sharm El Sheikh and Dahab with a length of 80 km, at a cost of EGP 50 million.

Objectives of the Transport and Communications Sector:

- Providing good land transportation between the governorate and the Canal governorates and the rest of the Republic through the Suez Canal in order to make movement easier for citizens and shorten distances
- Creating a strong link within the cities of the governorate and some of them
- The Authority of rapid means of transport between the governorate and theCanal Zone and various parts of the Republic as well as with the outside world through air transport
- Providing the necessary services for intensive land transport for both passengers and goods by taking advantage of the huge expanse of the region's sea beaches in order to support global trade and tourism
- Developing the land ports for the axes linking the roads between the governorate and the rest of the Republic in proportion to the volume of transport movement expected on them

The most important achievements of roads and ports:

- 9.3 billion national, external and internal road costs
- 17 paving, afforestation and completion of internal roads with a length of more than 50 km and a cost of EGP 210 mn have been denied
- 5 seaports have been developed (Sharm El Sheikh Sea Port - Nuweiba Sea Port - Tur Sea Port - Sinai Fishing Port - Abuznema Port)
- EGP 72 mn cost of developing a fishing port in Tur Sinai with a length of 72 m2 90% of the project has been completed
- $383.1 Million Total Cost of International Road Duplication Project Tunnel / Sharm El Sheikh
- 3road paving and upgrading projects at an estimated cost of EGP 95 mn 95% of the three projects have been completed to facilitate the movement of citizens and support the tourism sector
- EGP 49mn for the total cost of lengthening Memphis Tab El Bary

Figure 24: Sharm El Sheikh Roads

Figure 25: Taxi as a means of transportation in Sharm El Sheikh

5.2.9 Tourism And antiquities

5.2.9.1 Natural and tourist attractions

5.2.9.1.1 Naama Bay

Naama Bay is located at the crossroads of Asia and Africa in the heart of Sharm El Sheikh, and is one of the attractive areas for tourists because it enjoys excellent environmental and tourist advantages, such as the waters of the Red Sea, rich in coral reefs, soft sand, and warm weather throughout the year. The bay is also famous for swimming with colorful fish, and watching coral reefs Through glass boats, diving, sailing and water skiing. Naama Bay is characterized by its streets bearing the names of Arab leaders and kings, and the multiplicity of restaurants, cafes, commercial markets, and international hotel and resort chains.

Figure 26: Naama Bay

5.2.9.1.2 Shark's Bay

Shark's Bay is one of the areas located in Sharm El Sheikh, known for its picturesque landscapes and world-class tourist resorts. As for why it was called by this name, several different stories spread, including that sharks actually lived in this bay until 12 years ago, while it was reported that there was confusion among some tourists who thought that manta rays (manta rays) were sharks, while another story tells that local fishermen used to unload the sharks they caught in this particular bay. However, today it is known that this bay is free of sharks.

Figure 27: Shark Bay

5.2.9.2 Ras Mohammed Reserve

The Ras Mohammed Reserve is located at the confluence of the Gulf of Suez and the Gulf of Aqaba in South Sinai, about 12 km from the city of Sharm el-Sheikh. The reserve is considered one of the most famous landmarks of Sinai at all, and it was declared a nature reserve in 1983 and is classified as a World Heritage Reserve and covers an area of 850 km, and includes the islands

of Tiran and Sanafir, and the eastern edge of the reserve represents a rocky wall with the waters of the Gulf in which it is located Coral reefs, and the **mangrove channel** separates the Ras Mohammed Peninsula from **Al Ba'ira Island** with a length of about 250 meters.

Ras Mohammed is characterized by coral beaches located in the depths of the Ras Mohammed water ocean, colorful fish, endangered sea turtles and rare aquatic life, and the coral reefs surround Ras Mohammed from all its marine sides, and below the peninsula there are many water caves. The reserve is home to many birds, animals and insects, and there are many species of marine animals as well as about 150 types of coral reefs. The reserve also has several fossils between 75,000 and 20 million years old. The reserve is one of the most beautiful diving places in the world and the most important attractions in it: **the enchanted pond** area, which depends on the movement of tides, the **ancient earthquake** area, the **mangrove** area, coral and bird viewing points, in addition to the beach area designated for swimming

Figure 28: Ras Mohammed Reserve

5.2.9.3 Nabq Reserve

Nabq Reserve is located on an area of 600 km in the area between Sharm El-Sheikh, Dahab and Wadi um Adawi in South Sinai, 500 km from Cairo, and about 35 km from Sharm El-Sheikh, and was declared a nature reserve in 1992, the area of the reserve is about 600 km 440 km on land in addition to 160 km within the water range. The reserve is characterized by containing several ecosystems (mountainous, desert and marine), and there are a large number of biota Banat and birds besides many. Types of invertebrates, rodents, rare reptiles, colorful fish and shellfish The reserve includes a unique plant system, with about 134 plant species, of which at least 86 species have completely disappeared elsewhere. The reserve is considered one of the distinctive tourist attractions in Sinai, as it attracts diving enthusiasts, camping in the desert, observing animals and birds, and is characterized by its proximity to many tourist destinations and places such as Taba and Dahab. In addition to two of the most famous tourist places around the world, which are the monastery and Mount St. Catherine

Figure 29: Protected Areas

5.2.9.4 Religious monuments

Sharm El Sheikh includes several Islamic mosques built on distinctive architectural styles, the most famous of which are the Al-Salam Mosque, which opened on December 12, 2001,[24] the Mustafa Mosque, which opened on October 26, 2007, and the Sahaba Mosque, which opened on March 24th 2017.

Figure 30: Al Salam Mosque

Figure 31: Al Mustafa Mosque

The city also includes the Church of the Heavens, which is the largest church in Sinai, and is located in the Al-Nour neighborhood of Sharm El-Sheikh. The foundation of the church was laid by Pope Shenouda III, Pope of Alexandria and Patriarch of the See of St. Mark on March 22, 2002, and inaugurated it on December 5, 2010 at a total cost of 100 million Egyptian pounds, serving more than 12,000 Christians in the city.

Figure 32: Church of the Heavenly

Sharm El Sheikh International Museum

A museum under construction on an area of 52 acres, with 14% of the construction rate, and the rest green spaces, parking spaces, and open exhibition areas. The museum sheds light on the Sinai city, highlights its role in terms of archeology and history, and displays 7,000 artifacts starting from the Pharaonic era to the modern era, and includes 7 exhibition halls, theater and cinema, in addition to a conference hall that can accommodate 1,000 people, restrooms, shops and bazaars, in addition to the children's and family library, and is equipped with a water desalination plant with a capacity of 800 cubic meters, and another seawater treatment plant to be used in irrigating crops that will be established in the museum, as well as rooms for electricity generators, and stores for artifacts. The Establishing the museum with the aim of diversifying the tourism product for the visitors of Sharm El-Sheikh, and saving them the trouble of traveling to visit museums in Cairo, especially since most of the city's visitors return to their country immediately after the end of their trips without visiting the archaeological areas.

Peace Park

Located on an area of 33 acres, the Peace Garden or International Botanical Garden in Sharm El Sheikh contains 37 species of rare medicinal plants and includes 3 main sites:

- Biodiversity Information Center: which supports local communities by marketing products to visitors to Sharm El Sheikh, helping to develop these communities economically and socially.
- Peace and Environment Museum: which includes the Peacemakers Hall to display environmental documentaries. And the President's Pavilion, which contains photographs and documents of the 1989 Taba Agreement and the Camp David Treaty.

Figure 33: Peace Park

Sinai Biodiversity Diorama

- The Peace Icon is a monument in the middle of the 36,000-meter Peace **Square** at the entrance to Sharm el-Sheikh International Airport, Dahab Road and Sharm El-Sheikh Ring Road. The icon is designed in the form of clusters of black granite bearing lotus leaves , surmounted by eight wings inspired by the wings of Ra holding a 10-meter globe on it. The world map is made of stainless steel, marked with the location of Egypt in gold and flying over it the pigeons carrying the olive branch as a symbol of peace, and the eight wings indicate the main directions, north, south, east, west, northeast, northwest, southeast, and southwest.
- The height of the icon is about 34.5 meters, the net height is 26.5 meters, and the width of the wings is 24 meters, and the icon is surrounded by a fountain with a diameter of 35 meters, with about 47 water exit nozzles of different heights up to 16 meters in a spiral, and the location of the icon was coordinated using a mixture of circles around the fountain, which is formed by a mixture of colorful plantings and flowers, as well as stones and tiling, and the work of a parking area with an entrance to the square in front of the icon surrounded by palms was taken into account.

Figure 34: Peace Icon

Sharm El-Sheikh Plane Victims Memorial

On January 3, 2004, a flight 604 air disaster occurred on a Boeing 737 belonging to Flash Airlines, an Egyptian airline, killing 148 people, including 133 French, Moroccan, and Japanese tourists, and 13 crew members. The plane crashed over the waters of the Gulf of Aqaba, 10 km from the shore of Naama Bay. Just ten minutes after taking off from Sharm el-Sheikh International Airport en route to Cairo and from there to Paris, following the accident, the Egyptian government built a memorial in Sharm el-Sheikh for the victims of the doomed plane, which was inaugurated in May 2006. The memorial was designed as a symbol of the plane crash, and was technically treated to move whenever the wind blows and calm down, expressing the idea of stillness and movement between life and death

The population of South Sinai and the city of Sharm el-Sheikh has increased rapidly since the full return of Sinai to Egypt in 1982. This trend is underpinned by the growth of hotel capacity from 19,000 beds in 1998 to nearly 54,000 beds (in 177 hotels) in 2017.

There was a significant drop in tourist numbers starting with the 25 January 2011 revolution, exacerbated by the downing of a Russian jet in 2015 which led to a no-fly ban from the UK and Russia. As a result, the number of tourists visiting Sharm El Sheikh fell to 127,000 in 2016, resulting in heavy financial and operational burdens on most hotels; Room occupancy rate decreased by 52% from 2015 to 2016, 54 local and unbranded hotels were closed in 2016. Moreover, the type of tourists heading to Sharm El Sheikh has changed since 2011, with the high ratio of low cost and Egyptian travelers. The decline in the tourism economy has led to a significant decline in investment and urban development.

5.2.9.5 Livestock & Fisheries

Fish farms

South Sinai Governorate enjoys a variety of fish wealth throughout the year as a result of the extension of the province on the Gulf of Suez and Aqaba and the productivity of fish wealth is concentrated in the area (Ras Sidr - Ras Landfill), especially in the plain fishing season during the month of (September - October - November) in addition to the colorful fish and rare coral reefs in the Ras Mohammed area and the point corresponding to the two gulfs.

Fish wealth is a source of protein food for humans and one of the most important types of fish in the governorate: feeling - grimace - improved - whiteness - drake - beet - storyteller - mullet - borer - Sejan - plain.

Ornamental fish: Enjoy the province, especially the Gulf of Aqaba region multiple types of ornamental fish has been established project ornamental fish in the province to export these rare species abroad, which provides a difficult work and authorizes the fishing of ornamental fish in all coasts of the province except diving areas and nature reserves and the amount of fish that are exported about 20,000 fish annually .characterized by some areas of the province the presence of herbs and plants proven medically viable and has been the sons of the province to use herbal treatment extracted Of herbs and natural plants in the treatment of cold, cough, colic, skin diseases, rheumatism and others

Animal Production and Livestock Breeding

Animal husbandry is considered an important economic activity in South Sinai, because it provides income for a percentage of the population and includes the main types of animals being raised: camels, goats and sheep, where they provide milk, meat, wool, hair and skin, and there are three areas in the governorate with somewhat good opportunities for animal production, namely Wadi Grindel, Wadi Firan, and the southwestern coastal strip. But it is important to note that keeping animals in a fixed place is suitable for these areas, which are also used in growing crops, which necessitates the construction of fences or control of the movement of livestock to protect crops.

5.2.9.6 Education

Table 17: Educational status 10 years and above

شياخة / مدينة / قرية	النوع	الإجمالى	الحـالة التعـليمية (10 سنوات فأكثر)											
			أمى	يقرأ ويكتب بدون مؤهل	محو أمية	تربية فكرية	ابتدائية	اعدادية	ثانوية عامة/ أزهري	مؤهل متوسط فنى	مؤهل فوق المتوسط	مؤهل جامعى	دبلوم عالى	ماجستير	دكتوراه
منطقة حي النور	ذكور	1433	27	143	1	1	83	68	222	113	107	649	9	9	1
	إناث	1310	49	100	0	1	72	61	231	135	120	533	7	1	0
	جملة	2743	76	243	1	2	155	129	453	248	227	1182	16	10	1
تجمع وادي العاط	ذكور	3	1	0	0	0	1	1	0	0	0	0	0	0	0
	إناث	3	3	0	0	0	0	0	0	0	0	0	0	0	0
	جملة	6	4	0	0	0	1	1	0	0	0	0	0	0	0
تجمع وادي عواجة	ذكور	30	6	5	0	1	3	9	0	6	0	0	0	0	0
	إناث	30	11	4	0	0	2	13	0	0	0	0	0	0	0
	جملة	60	17	9	0	1	5	22	0	6	0	0	0	0	0
تجمع وادي الخروم	ذكور	25	11	0	0	0	7	4	1	2	0	0	0	0	0
	إناث	22	12	1	1	0	4	4	0	0	0	0	0	0	0
	جملة	47	23	1	1	0	11	8	1	2	0	0	0	0	0
تجمع وادي جدلة	ذكور	7	2	1	0	0	3	0	0	1	0	0	0	0	0
	إناث	9	4	1	0	0	4	0	0	0	0	0	0	0	0
	جملة	16	6	2	0	0	7	0	0	1	0	0	0	0	0
تجمع وادي الخناصير	ذكور	19	12	2	0	0	1	2	0	2	0	0	0	0	0
	إناث	20	16	1	0	0	0	3	0	0	0	0	0	0	0
	جملة	39	28	3	0	0	1	5	0	2	0	0	0	0	0
قسم ثان شرم الش															
منطقة نبق	ذكور	183	0	0	0	0	9	5	54	2	1	105	0	1	6
	إناث	125	0	4	0	0	9	7	56	1	1	47	0	0	0
	جملة	308	0	4	0	0	18	12	110	3	2	152	0	1	6
سبيتة	ذكور	24	5	12	0	0	6	1	0	0	0	0	0	0	0
	إناث	23	3	11	0	0	9	0	0	0	0	0	0	0	0
	جملة	47	8	23	0	0	15	1	0	0	0	0	0	0	0
وادى مندر	ذكور	78	11	46	0	0	21	0	0	0	0	0	0	0	0
	إناث	78	22	38	0	0	17	1	0	0	0	0	0	0	0
	جملة	156	33	84	0	0	38	1	0	0	0	0	0	0	0
الشرفا الشرقية	ذكور	126	63	34	0	0	25	3	1	0	0	0	0	0	0
	إناث	100	62	34	0	0	4	0	0	0	0	0	0	0	0
	جملة	226	125	68	0	0	29	3	1	0	0	0	0	0	0
الشرفا الغربية	ذكور	37	13	14	0	0	9	1	0	0	0	0	0	0	0
	إناث	35	16	14	0	0	5	0	0	0	0	0	0	0	0
	جملة	72	29	28	0	0	14	1	0	0	0	0	0	0	0

Table 18: Dropout from education from 6-20 by educational stage

Dropouts according to stage and grade (6-20 years)														Total	Sheikha / City / Village
Grade in the secondary stage (general / Azhari / technical)				Grade in middle school			Grade in the primary stage								
Sentence	3	2	1	Sentence	3	1	Sentence	6	5	4	3	2	1		

															First Department Sharm El Sheikh
0	0	0	0	1	0	0	1	1	0	0	0	0	0	2	Hayy Al Nour Area
2	0	2	0	1	0	1	1	0	1	0	0	0	0	4	
2	0	2	0	2	0	1	2	1	1	0	0	0	0	6	
Follow the first section of Sharm El-Sheikh															
10	0	1	9	0	0	0	2	0	0	1	0	1	0	12	Wadi Ruwaisat
5	0	1	4	5	0	3	3	0	0	0	1	1	1	13	
15	0	2	13	5	0	3	5	0	0	1	1	2	1	25	
1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	Wadi Al Atat Gathering
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
2	0	1	1	0	0	0	0	0	0	0	0	0	0	2	Wadi Awaja Gathering
5	0	2	3	0	0	0	0	0	0	0	0	0	0	5	
7	0	3	4	0	0	0	0	0	0	0	0	0	0	7	
1	0	1	0	2	0	2	0	0	0	0	0	0	0	3	Wadi Alkhrum Gathering
1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
2	0	1	1	2	0	2	0	0	0	0	0	0	0	4	
0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	Wadi Al-Khanaseer Gathering
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	Wadi Al-Nahij Gathering
4	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
6	0	0	6	0	0	0	0	0	0	0	0	0	0	6	
															Second section Sharm El Sheikh
0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	Wadi Mandar
0	0	0	0	1	0	1	1	0	0	1	0	0	0	2	
0	0	0	0	2	0	1	1	0	0	1	0	0	0	3	

0	0	0	0	10	0	5	2	0	0	2	0	0	0	12	Eastern Shorafa
0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
0	0	0	0	11	0	5	2	0	0	2	0	0	0	13	
1	0	0	1	2	0	2	0	0	0	0	0	0	0	3	Western Shorafa
0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	
1	0	0	1	3	0	3	0	0	0	0	0	0	0	4	

Source: Central Agency for Public Mobilization and Statistics (CAPMAS), Census 2017

Achievements of Sharm el-Sheikh Governorate in education:

- EGP 12.9 mn in total cost of establishing a factory for the production and conversion of solar panels at Tur Sinai Secondary Industrial School to train students.

Pre-University Education

- EGP 300.8 mn total cost of new educational projects
- 207 schools developed and maintained at a total cost of EGP 85.4 mn
- 78 schools were built during the period from 2014 to 2020, including 2 Egyptian-Japanese schools in Madini (Sharm El Sheikh - Tor Sinai) at a total cost of EGP 65.1 mn and on an area of 20 thousand square meters
- 9.9 million total costs of establishing a factory for the production and assembly of hand bulbs in Abu Zneima Industrial Secondary School with a production capacity of 800 thousand bulbs annually to train students.
- 20.5 million pounds total cost of the Sadat Institute for boys and girls.

Figure 35: Sharm El Sheikh Model Institute

Higher Education (King Salman International University)

$ 300 million The total cost of establishing King Salman University in South Sinai includes 17 colleges in various scientific disciplines

An integrated university that accommodates more than 20 thousand students, and includes about 11 colleges, including 5 practical "medicine, engineering, pharmacy, science, water, marine sciences, industries technology" and 6 theories, which are "private agriculture, community sciences, humanities, history and archeology, tourism, hotels and languages." King Salman University was built on an area of 720 acres and has three branches. King Salman University Branches Ras Sidr - Tur The total area of King Salman University, Ras Sidr branch, is 330 acres, and the study programs in that branch keep pace with the nature of the city Where there are 4 faculties, namely veterinary medicine and community sciences

* Desert Agriculture: The area of the administration building is 7787 m2, the educational building on an area of 5283 m2, and the college laboratories with an area of 10400 m2.

* Administrative Sciences: The area of the administration building is 6053 m2 and the educational building on an area of 4827 m2 and contains an amphitheater with a capacity of 400 students on an area of 2130 m2 and attached to it is an administration building built on an area of 7270 m2 and the library built on an area of 2468 m2, and housing for students with a capacity of 296 students and built on an area of 2340 m2 and housing for female students with a capacity of 296 students built on an area of 2340 m2 and housing for faculty members consisting of 28 housing units built on an area of 3654 m2.

King Salman University, Tur Branch:

The total area of King Salman University, Al-Tur branch, is 355 acres, and the study programs in that branch are offered through 8 colleges: -

Engineering The area of the administration building is 9083 m2 and the educational building is built on an area of 7261 m2.

Science The area of the administration building is 7850 m2 and the educational building is built on an area of 6681 m2.

Technological Industries The area of the administration building is 7947 m2 and the educational building is built on an area of 6875 m2.

Medicine - Dentistry - Pharmacy - Computer Science and Engineering. - Nursing.

Attached to it is a conference hall with a capacity of 1,250 people built on an area of 16,900 m2, student housing with a capacity of 1,480 students on an area of 2,340 m2, faculty housing consisting of 140 housing units built on an area of 3,654 m2, and a student services center on an area of 3,850 m2.

The Sharm El Sheikh branch on an area of 35 acres includes:

Faculty of Tourism and Hospitality - Al-Alsun and Applied Languages. - Architecture - Arts and Design - Faculty of Media Production.

Source: South Sinai Governorate Portal

5.2.9.7 Health

Figure 36: Family Medicine Unit in Wadi Mander – Sharm El Sheikh City

There is a family medicine unit in Wadi Mandir, and it is the closest health unit to the Bedouin community in Wadi Mandir or Tahrir, it is located near theMBT plant as well, where Bedouin women and their children go to the health unit to receive examination and treatment, do some analyzes, take serum for reptiles There, there are those who move to the General Hospital in Sharm El-Sheikh through their private car.

5.2.9.8 Industry and trade

Elements of Industrial Investment

South Sinai Governorate enjoys the presence of many raw materials that can be based on multiple industries, as the governorate's production of crude oil represents a third of the Republic's production in addition to natural gas as well as natural raw materials produced from quarries, and the governorate has vast land areas in multiple areas suitable for allocation for industrial projects in addition to the availability of a wide network of roads that connect the cities of the governorate to each other and link the governorate with the rest of the Republic, and one of the most important industries in the governorate is the oil extraction industry, marble products. Gypsum clay brick and there is one industrial zone in the province in Abu Zneima for heavy industries in the extractive areas and the most important factories in the province Sinai gypsum factory in Wadi Ghar Nadel Gypsum Calma factory in Ras Al-Malaab Ferromanganese factory in Abu Zneima amputation and gas factory Belayim Company Suez Oil Company General Petroleum Company.

5.2.9.9 Growth updates

Tourist destinations in Egypt, such as Sharm El Sheikh, have experienced population growth, industrialization, urbanization, and a change in consumption patterns. Population growth has put pressure on urban infrastructure already overburdened, especially after responsibility for urban services, such as transport, waste management and wastewater, was transferred to local authorities. South Sinai Governorate lacks the organizational and technical resources to meet the demand for public infrastructure. It also currently lacks a coherent long-term strategy and development agenda for sustainable development.

Private tourism investment dominates the Red Sea coast which prioritizes maximizing profits by providing entertainment services to tourists. The increase in tourism has led to the expansion of urban habitats into nearby sensitive coastal habitats and has been accompanied by inefficient consumption of energy and resources, poor management of solid waste and sanitation, local air and water pollution, and greenhouse gas emissions.

The challenge of making tourism sustainable is to balance biodiversity conservation and development for local people, with the harsh reality that tourism consumes resources and energy, creates waste, and requires infrastructure. In addition, there is a lack of integration between the tourist environment and the existing (old) cities. Facilities and facilities developed for tourists are usually not available (or not used) to members of the local community. This distinction between the luxurious tourist areas on the beach and the backdrop of poorer areas creates a contrasting urban area. Tourists feel that the proceeds of their trips are not benefiting the local community, while the local community feels marginalized. Overcoming this contradiction is essential for the sustainable development of coastal communities like Sharm El Sheikh.

5.2.10 Tahrir Community

5.2.10.1 Methodology and activities of the consultation process

The study team adopted the participatory rapid research methodology to include different groups of society in a short time. The study team conducted a site visit to the project to identify the targeted areas, which were mainly represented in the city of Sharm El-Sheikh Wadi Al-Khanasir, in which the project area is located. To date, the consultants have held the following consultative activities:

1- On November 29, 2022, the exploratory phase began with a site visit to the waste treatment facility in cooperation with the implementation officials, the owner of the solid waste sorting and recycling plant in Al-Khanasir from Zahrit Ganoub Sinai Company.
2- This was followed by a consultation with different stakeholders as Ruwaysat traders, waste colloecters, and hotel represntatives which lasted until December 1, 2022.
3- The study team visited Wadi Al-Shorafa, and the Tahrir Valley (Bedouin communities) to identify the different groups involved.

Figure37 : Photos of project site visit

5.2.10.2 Identification of the groups involved

For the project of introducing a new workstream, stakeholders were identified and divided according to the group and the specific category, its role, the extent of its interest in the project and the extent of its ability to affect it:

Table 19: Potential Categories of Concerned for the Development of a Solid Waste Sorting and Recycling Plant

Stakeholder	Category	Their role and their connection to the project	Their interest and influence
Government Administrative Sector			
Governorates	**South Sinai Governorate**	• Coordination of solid waste management projects. The province has chaired all coordination activities. • Allocating the lands for solid waste management such as the MBT plant.	• High interest in the project • Their ability to influence the project is High.

Stakeholder	Category	Their role and their connection to the project	Their interest and influence
City and neighborhood councils	• Sharm El Sheikh City (Information Center) In addition to the Urban Planning Authority	• Coordination with the governorate and the information center in Sharm El-Sheikh and the preparation of the necessary permits for the development of the waste recycling plant. • Allocation of the plot of land. • Providing accurate data on the project areas. • Provide infrastructure maps	• High interest in the project • Their ability to influence the project is high
Various ministries and government agencies			
General Authority for Roads and Bridges	**General Authority for Roads and Bridges in South Sinai Governorate**	• Review the location of the facilities such as MBT plant and verify that it does not cross major roads. • Propose ways to mitigate the effects in the event of blocking major roads. • Granting licenses for development.	• Low interest in the project • Their ability to influence the project is low.

Stakeholder	Category	Their role and their connection to the project	Their interest and influence
Ministry of Health	**Hospitals affiliated with the Ministry of Health and ambulances.**	• Providing medical service to the project workers. • Conduct the first medical examination of the labor. • Follow-up precautionary measures for the Corona virus.	• Low interest in the project • Their ability to influence the project is High.
Community			
Locals	**Population of Bedouin communities (Tahrir community)**	• They are the main beneficiaries of organic waste.	• High interest in the project • Their ability to influence the project is High.
	Natural leaders (members of parliaments - natural leaders - tribal sheikhs - tribal rule)	• They are one of the very important groups to form the societal orientation towards the project as they are two of the opinion makers in society and have a voice among people.	• Medium interest in the project • Their ability to influence the project is High.
Environmental Sector			
Waste Management Regulatory Authority (WMRA)	**Regulatory Authority**	WMRA is the regulatory authority that carries out planning activities on a national level.	• Medium interest in the project • Their ability to influence the project is Medium

Stakeholder	Category	Their role and their connection to the project	Their interest and influence
Environmental Affairs Agency	**North Sinai Regional office**	• Laying the foundations for conducting environmental studies. • Review of environmental studies. • Prepare a follow-up plan for the project.	• Medium interest in the project • Their ability to influence the project is High.
	Department of Environmental Affairs in Sharm El-Sheikh	• Review of environmental studies. • Implementation of a follow-up plan for the project.	• Medium interest in the project • Their ability to influence the project is Medium.
Security Agencies			
Security Agencies		• Special coordination measures should be taken with them	• Medium interest in the project • Their ability to influence the project is high.
	Road Security Department	• Special coordination measures should be taken with them	• Low interest in the project • Their ability to influence the project is high.
	Traffic Department in South Sinai Governorate – Sharm El Sheikh City	• Follow up the contractor's commitment to traffic procedures and not affect traffic flow • Verify that drivers adhere to the legal speed.	• Low interest in the project • Their ability to influence the project is high.
Contractors & Suppliers			

Stakeholder	Category	Their role and their connection to the project	Their interest and influence
Implementation Contractors	**Zahrit Ganoub Sinai Company**	• Implementation of various project activities. • Implementation of the environmental management plan during the development phase • Repair any damage to the plant and infrastructure.	• High interest in the project • Their ability to influence the project is High.
	Food Supply Contractors	• Supply of food, beverages, water and services for labor.	• High interest in the project • Their ability to influence the project is high.
Zahrit Ganoub Sinai Company	**Solid waste**	• Zahrit Ganoub Sinai Company is the owner of the MBT Plant as well as the main government authority concerned with supervising the implementation and operation activities of the project. • Operate in collection • Supervises the activities of the environmental and social management plan during the project implementation phases.	• High interest in the project • Their ability to influence the project is High.
Others			

Stakeholder	Category	Their role and their connection to the project	Their interest and influence
Civil society (Bedouin companies to collect waste from hotels - homes)		• Plays an active role in awareness activities associated with the project.	• High interest in the project • Their ability to influence the project is high
Media	**Websites**	• They will play an important role in making information about the project available, especially to target customers.	• Medium interest in the project • Their ability to influence the project is great
universities	**South Sinai University**	• Attend public consultation sessions to introduce the project and review mitigating measures.	• Weak interest in the project • Their ability to influence the project is average.

5.2.10.3 Description of Tahrir community

Figure 38: Bedouin Houses – Grocer

The Bedouin of Tahrir live 2 kilometers away from the MBT plant, and they are about 20 separate family, and each family consists of 5 to 6 members, and most of them work in grazing sheep and camels, raising them and selling them, as women raise sheep and sell sometimes, men also collect and transport organic waste from the hotels and sell it to members of their Bedouin Community as contractors.

The level of education of the Bedouin men and women in the Tahrir community is almost non-existent, except a few of them who obtain preparatory primary school. As for children, many of them attend a one-class school, and the rest of the children are uneducated because they are registered in schools in Dahab and Nuweiba, or that the nearest school is in Al-Shurafa. There is no means of transportation there. Either Bedouin Mandir or Al-Shurafa, 70% of the children are enrolled in a school in Al-Shurafa, and they drop out of education after the primary stage, and a few drop out after the middle school.

The Bedouins of Tahrir cannot be described as indigenous. UNDP's Standard 6: Indigenous Peoples defines indigenous people as peoples and nations, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them." According to this definition and the consultation findings, the Bedouins of Tahrir (the nearest Bedouin community to the landfill) are not indigenous peoples to Sharm el Sheikh.

Some of them lead nomadic lifestyle and do have some cultural aspects of Nomadic Bedouins, such as inhabiting the base of mountains. They are however, very much integrated in the modern social constructs in Sharm el sheikh, they have means such as Toyota cars, access to public health facilities and other services.

In addition, Bedouins are not considered Indigenous Peoples under Egyptian Law. The International Work Group for Indigenous Affairs (IWGIA), a global human rights organization

dedicated to promoting, protecting and defending Indigenous Peoples' rights, does not recognize Bedouins as Indigenous Peoples. [23]

Table 20: Screaning for Indigenous Peoples According to UNDP's SES

UNDP SES Standard 6 Criteria	The Bedouins of Tahrir
Self-identifies as indigenous peoples;	No, they identify as Egyptians however they call themselves Bedouins, not indigenous.
Has pursued its own concept and way of human development in a given socio-economic, political and historical context;	No.
Has tried to maintain its distinct group identity, languages, traditional beliefs, customs, laws and institutions, worldviews and ways of life;	Bedouins have their own customs and traditions but as an ethnic group and not as indigenous people. They also use public facilities such as schools, health clinics and units and work in cities. Furthermore, Bedouins are subject to national Egyptian laws.
has exercised control and management of the lands, natural resources, and territories that it has historically used and occupied, with which it has a special connection, and upon which its physical and cultural survival as indigenous peoples typically depend;	No, there is an informal understanding and agreement in mutual benefits from all stakeholders as identified through the consultant's site visit interviews with all stakeholders. Bedouins have an informal control over some territorries in which they live and move in. They also offer informal and formal security services to both governmental and private entities especially around mountains given that they know the area very well and that they have the cars (pick-up trucks) and the resources for these service. In return they get certain benefits and priorities. owever, all the land are either privately owned or public and all land are subject to Egyptian law.
whether its existence pre-dates those that colonized the lands within which it was originally found or of which it was then dispossessed.	No, Egypt is an ancient civilization that dates back to more than 7000 years, which is much older than the earliest recorded settlement of any Bedouins in the Country. Bedouins on the

[23] Countries - IWGIA - International Work Group for Indigenous Affairs

	other hand, are considered to be of Arab descent, originating in the Arab Peninsula, namely the Syrian Desert and Arabian Desert and spread across the rest of the Arab world in West Asia and North Africa between the 14th and 18th centuries. They are therefore immigrants and not original occupants of the land. The definition cannot be applied to the Bedouins of Sharm El Sheikh. On other hand, the Bedouin community of Tahrir have only resided in this area near the landfill 2 years ago based on the consultations and relocate based on cultural and geographical reasons. They are therefore not indigenous people of Sharm el Sheikh.

5.2.10.4 Gender in Tahrir Community

After consultations and interviews with Bedouin women who live in the Tahrir area near the waste recycling plant about 2 kilometers away, it was found that they use organic waste that is collected by men from the waste plant to feed goats and camels and dry them in front of their homes to feed the animals later or sell them to other Bedouin families. Women are not allowed to use the cars that men have in the community, and they commute from their residence on foot to drop off children to school, for example. And we find that the average number of family members is about 3-5 children per family, and the Bedouin man marries more than one wife, and they live in one or two places near each other. Women raise animals, feed them, and sell them themselves as a means of livelihood, and men also sell them to the people in Sharm El-Sheikh On occasions (weddings - al-Aqiqah), the Bedouins were not affected at all by the MBT plant, as they said, as they are far enough from the factory and do not complain of smells or dust, and the flies around them come from the organic drying.

Figure 39: Bedouin Tent - Bedouin Life

6 Environmental and Social Risks and Impacts

The assessment method is used to identify the most significant impacts of the project, and appropriate mitigation actions to be applied to eliminate or reduce the negative impact of such impacts on the environment and surrounding society as much as possible.

6.1 Evaluation and Impact Assessment Methodology

The potential environmental impacts on the physical environment are evaluated against baseline conditions at the proposed locations and the applicable legal framework for the project.

Each potential impact resulting directly or indirectly from the project is categorized based on the **magnitude** and the **Receptor Sensitivity.** Based on these two parameters, the **Impact Significance** is evaluated. The significance of each potential impact will depend on the project activities and the potential impacts on the environmental receptor. **Impact Magnitude:** The criteria for defining the impact magnitude includes assessing the following parameters, see Figure below.

- Magnitude: describes the quantity of the resource (or receptor) potentially affected by the activity.
- Spatial extent: the geographical area over which the impact is experienced.
- Duration: the length of time over which the impact will be experienced. An impact may be present only while an activity is active, or it could persist long after the activity has ceased, in which case the duration may be regarded as the time the receptor needs to recover from the effect.

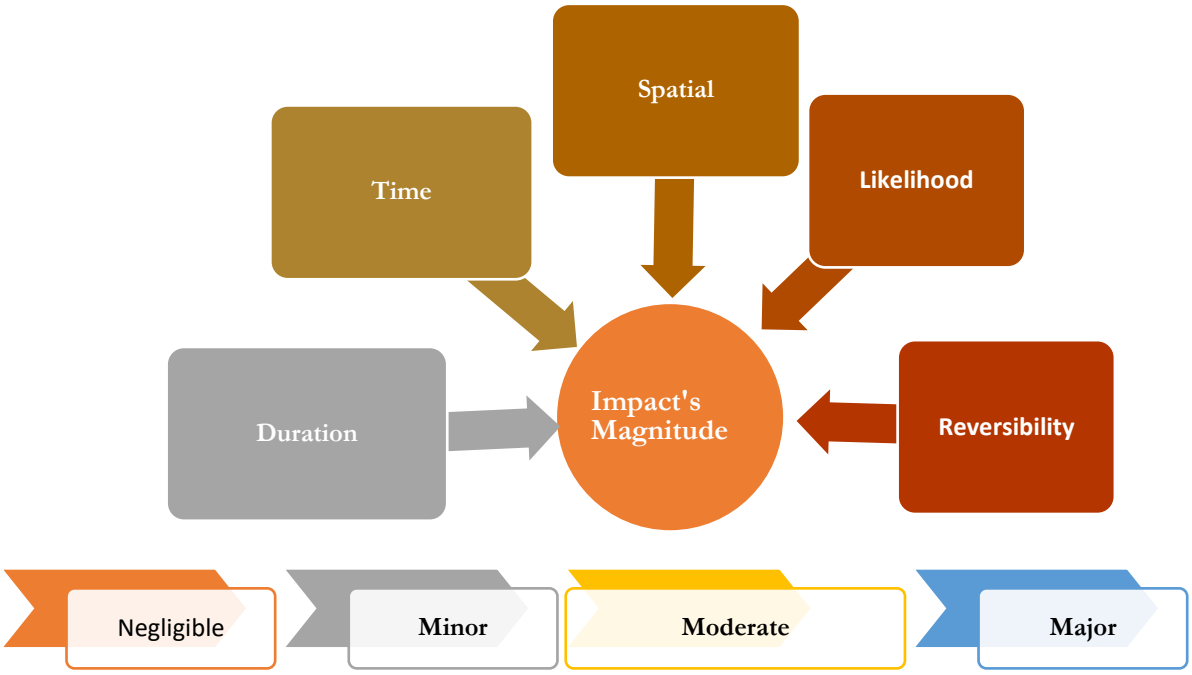

Figure 40: Basic Impact Index Assessment

Each potential positive and negative impact resulting directly or indirectly from the project will be categorized based on Magnitude and Sensitivity of the receptor.

a) Magnitude of Impact: The impact resulting from the project will first be categorized as a positive or negative impact; the latter will be further analysed, and its magnitude assessed as: Negligible, Minor, Moderate, or Major. Various considerations come into play as the experts assess the impacts, the main parameters are:

- Duration – As the time duration of the impact increases, it is weighed more heavily. Special consideration is given to impacts that go beyond the project's anticipated life-expectancy.
- Time – The time of which an impact commences or occurs can be vital to construction and maintenance operations.
- Spatial – The area impacted is to be considered, as some impacts may extend beyond the project's boundaries or interfere with land regulations, etc.
- Likelihood – The chance of an impact occurring and its frequency is to be assessed
- Reversibility – The possibility and extent to which an impact can be intervened or mitigated for a factor to return to the Baseline environment

After an analysis of the various parameters, an impact's magnitude is categorized as follows:

- Negligible – No anticipated change to the baseline environment
- Low – Minor anticipated change to the baseline environment
- Medium – Moderate anticipated change to the baseline environment
- High – Significant anticipated change to the baseline environment

Moderate and Major impacts usually cause a major temporary variance to the baseline conditions or a long-term ongoing modification.

b) Sensitivity of the receptor: Sensitivity of the receptor is based on the relationship between the respective project and present baseline environment (the receptor). It is assessed based on vulnerability of the receptor, including the surrounding population and environment. As the effect of an impact is more readily absorbed and easily mitigated it is less sensitive; on the other hand, as an impact is more challenging to mitigate and cannot be absorbed by the population and environment it becomes more sensitive and requires an extensive management plan.

The sensitivity of the receptor is assessed as:

- Low- Existing capacity to absorb/mitigate impact
- Medium – Limited capacity to absorb/mitigate impact
- High – No capacity to absorb/mitigate impact

c) Impact Evaluation: The virtual resultant of the magnitude of the impact and sensitivity of the receptor for each impact is evaluated to generate the impact's significance and overall assessment. The following chart illustrates how the two factors are coupled:

Table 21: Impact Evaluation

Sensitivity of Receptor	Magnitude			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible

6.2 Identification, evaluation and assessment of key environmental and social impacts

The identification of the potential impacts took into consideration the potential impacts from the proposed project on the following receptors:

- Occupational Health and Safety
- Employment
- Community H&S
- Physical Displacement
- Economic Displacement
- Air quality (GHG emissions)
- Landfill Capacity
- Quality of Compost
- Efficiency of MBT facility
- City Cleanliness and Littering
- Overall Waste Management & Waste Hierarchy

The identification of the impacts from the different project activities are summarized in the table below.

Table 22: Identification of Impacts

Location within Supply Chain	Project Activities/Intervention	Hotel Staff OHS	Collection Workers OHS	MBT Workers OHS	Segregation Quality	Employment	Community H&S	Economic Displacement	GHG	Landfill Capacity	Quality of Compost	Efficiency of MBT facility	City Cleanliness and Littering	Economics of Waste Management	Future master planning	Overall Waste Management & Waste Hierarchy & Safe disposal
Source (Hotels)	Training of the hotel's staff at source for consequent separate collection and monitoring of volumes and masses	+	+	0	+	0	+	0	0	0	+	+	+	+		+
	Source Separation (increase separate collection)	0	+	0	+	0	+	0	+	+	+	+	0	+	+	+
	Record masses and volumes of the separated fractions	0	0	0	0	0	0	0	0	0	0	0	0	0	+	+
Collection & Transport	New contracts with collection companies (Be'ah and Green Planet) to secure the complete fraction-separated collection	0	+	0	+	+	0	0	0	0	+	+	+	+	0	+
MBT Facility	Capacity building activities (in-depth waste management training for the Bedouin community	0	0	+	0	0	0	0	+	0	+	+	0	+	0	+

Location within Supply Chain	Project Activities/Intervention	Hotel Staff OHS	Collection Workers OHS	MBT Workers OHS	Segregation Quality	Employment	Community H&S	Economic Displacement	GHG	Landfill Capacity	Quality of Compost	Efficiency of MBT facility	City Cleanliness and Littering	Economics of Waste Management	Future master planning	Overall Waste Management & Waste Hierarchy & Safe disposal
	managing the Wadi Khanasir area)															
	Optimization of the sorting facility at Wadi Khanasir & detect & fix deficits (operative/technical problems)	0	0	+	0	0	0	0	+	+	+	+	0	+	0	+
	Composting process optimization (after hand sorting: Function of the turning machine, water supply, last separation by the compost screen, quality and application of the compost)	0	0	+	0	0	0	0	+	+	+	+	0	+	0	+
Monitoring Activities	Install proper working organization of public waste management in Sharm El-Sheikh.	0	0		+	0	+	0	+	+	0	0	+	0	+	+

Location within Supply Chain	Project Activities/Intervention	Hotel Staff OHS	Collection Workers OHS	MBT Workers OHS	Segregation Quality	Employment	Community H&S	Economic Displacement	GHG	Landfill Capacity	Quality of Compost	Efficiency of MBT facility	City Cleanliness and Littering	Economics of Waste Management	Future master planning	Overall Waste Management & Waste Hierarchy & Safe disposal
Further treatment	Monitoring and optimization of further treatment of other waste fractions	0	0	+	0	0	0	0	0	0	0	0	0	0	+	+
	Options for best treatment of separate collected organics- Decentralized /Centralized Composting	0	0	0	0	0	0	0	0	0	0	0	0	+	0	0

6.3 Positive Impacts

The project activities, namely activities from the workstream are expected to result in numerous positive impacts namely the following:

Table 23: Positive impacts of workstream activities

Location within supply chain	Project Intervention	Description of positive impact
Hotel	Training of the hotel's staff and Source Separation (increase separate collection)	Training of the hotel staff will have the following positive impacts: • Improve the operational collection of waste from hotels which will reduce the accumulated waste. • People separating the waste at the hotels (positive OHS impact as a result of training) • Better segregation of waste at source, therefore higher recovery of recyclables. • Availability of higher quality of compost that will support circular economy and allow its reuse in green areas • Increased Recycling Rate and higher revenue streams: Achieve and raise recycling targets by accurately segregating waste. Waste segregation practices prevents items suitable for recycling (such as metals, cardboard and plastics) from being thrown away with general waste. • Reduced Landfill Impact: Segregating waste allows higher diversion from landfills. This, in turn, reduces the landfill space requirements and GHG emissions.
	Establish baseline-record masses and volumes of the separated fractions	• Establishing an accurate baseline will support and allow for accurate waste management planning and lower unnecessary investment costs for expansion of the MBT facility. • Support the activation of the main plans for the management of solid waste in South Sinai governorate.
	Investigate decentralized composting directly on the resort's area (as far	• Check options for best treatment of separate collected. • Proper treatment of the organics will contribute the highest share of GHG-reduction within waste

Location within supply chain	Project Intervention	Description of positive impact
	as locally possible, e.g. as seen at the resort Movenpick)	management, since the methane forming dump siting is eliminated • Will ensure controlled treatment and eliminate pests, open burning and OHS risks
	Investigate collection and centralized composting such as the site of the sewage water treatment	• Shorter ways than to Wadi Khanaseer • Since water is available on site and organics are source separated, the produced compost is of very high quality (a highly desired material to improve the local soils). • Proper treatment of the organics will contribute the highest share of GHG-reduction within waste management, since the methane forming dump siting is eliminated • Will ensure controlled treatment and eliminate pests, open burning and OHS risks
Collection	New contracts with collection companies (Be'ah and Green Planet) to secure the complete fraction-separated collection	• The experience of currently operational collection companies will be employed under the supervision of the new contracts. The new contracts are the officially hired entities who will carry out monitoring, thus allow the utilization of the experience of the old workers under the new accountability structure. This will ensure higher efficiency of segregated fractions collection, less littering, adherence to OHS requirements, and compliance to laws and regulatory requirements. • Encourage private sector participation in waste management. • Reduced bloom of flies and rodents as a result of safe waste disposal. • Reduce the discomfort caused by odors resulting from random dumping and throwing of waste. • Clean, safe and green neighbourhoods • The new structure will contribute to the overall improvement of the environmental performance of the collection practices, and consequently the success of the overall project goals (such as landfill space reduction, higher efficiency of MBT facility, etc.. Hiring of new companies will also increase the employment opportunities.

Location within supply chain	Project Intervention	Description of positive impact
MBT Facility	Capacity building activities	Capacity building activities will : • Enable staff to carry out periodic maintenance to reduce chances of possible malfunctioning of equipment and resulting emissions. • Enable staff to carry out emergency maintenance internally or mobilize support and additional resources to shorten malfunctioning periods. • Ensure that proper OHS practices are followed. • Optimize the operational conditions of the facility
	Optimization of the sorting facility and composting process at Wadi Khanasir	The main objective of the development of the sorting plant/recycling and disposal of waste in a safe manner to serve the city of Sharm el-Sheikh and South Sinai governorate. Detecting & fixing deficits (operative/technical problems) will ensure: • Optimized operation for maximum capacity and quality of the processes. • Possibly create job opportunities for those who create, maintain, operate, develop and follow up the station. • Ensure compliance of equipment with environmental performance requirements. • Eliminate possible OHS hazards that may result from malfunctioning equipment. • Increase resource efficiency and increase resources • Encourage private sector participation in waste management.
Monitoring Activities	Install proper working organization of public waste management in Sharm El-Sheikh.	The new working organization will create a reporting structure that will ensure higher efficiency of segregated fractions collection, less littering, adherence to OHS requirements, and compliance to laws and regulatory requirements.
Further treatment	Monitoring and optimization of further treatment of other waste fractions	Further treatment options, such as treatment of hazardous materials will: • Ensure maximum utilization/recycling potential and safe disposal. • Eliminate possible OHS hazards that may result from unsafe recycling practices.

6.4 Negative Impacts

6.4.1 Design and preparation phase

6.4.1.1 Risk of improper design of pilot segregation of the 20 hotels activity

Improper design of the pilot segregation of the 20 hotels activity could lead to misleading results on the available amounts for use. This could in turn impact the capacity of the anaerobic digestor vessels and the MBT design capacity upgrade requirements. The risk could arise from:

- Inadequate training programs that do not take into account the current capacity of the staff.
- Choice of facilities that may not be representative of the vast majority within the city.
- Lack of standardized monitoring programs across the facilities.

Risk of improper design of the pilot phase is considered short term (spans over the pilot project), local, medium likelihood and reversible. The receptor (the planning phase) is of high sensitivity and the impact significance is therefore considered to be moderate.

The Risk of improper design of pilot phase on future solid waste planning in Sharm is considered **Moderate**.

6.4.2 Pilot segregation of the 20 hotels activity implementation

6.4.2.1 Risk of business as usual

Risk of pilot segregation activity failure in the 20 hotels as a result of improper management in any part of the supply chain (namely segregation at source, collection or treatment) will lead to misleading results and will consequently negatively impact the overall project.

Risk of business as usual is considered long term (spans beyond the pilot phase), high spatial extent, of medium likelihood and irreversible. The receptor (the planning phase) is of high sensitivity and the impact significance is therefore considered to be high.

Accordingly, the Risk significance of business as usual is High.

6.4.2.1.1 Risk of improper segregation at the source (Hotels)

Improper segregation of waste during the pilot phase will lead to misleading baseline results, will affect the planning process and eventually lead to the continuation of the current situation of using inaccurate information (based on assumptions)

6.4.2.1.2 Risk of mixing of segregated waste during collection & transport

The waste operator's contractual agreement holds him accountable for securing the complete fraction-separated collection and transport to the sorting/composting/dump site and ensuring that all fractions are collected in the designated colour coded bags according to the concerned content.

Such a risk will continue over the duration of the project, is local to the pilot area, has a medium likelihood of occurrence and is reversible once discovered. The risk is therefore considered to be of medium magnitude.

Since the sensitivity of the receptor (the project) is considered high, the overall impact is considered to be medium.

Accordingly, the risk of mixing of segregated waste during collection & transport is Medium.

6.4.3 Impacts from composting introduced within the new workstream[24]

6.4.4 Ambient air emissions for decentralized composting

Releases to the air can include direct stack emissions and fugitive emissions associated with biological processes, as well as emissions from burning of biogas. Direct air emissions can include bioaerosols, particulate matter/dust, ammonia, amines, volatile organic compounds (VOCs), sulfides, odors, etc.

The risk will continue over the duration of the project, is local to the pilot area, has a low likelihood of occurrence since it will happen in a closed vessel and is reversible once discovered. The risk is therefore considered to be of low magnitude.

Since the sensitivity of the receptor (air quality) is considered high, the overall impact is considered to be medium.

The impact significance of ambient air emissions for decentralized composting is Medium.

6.4.4.1 Leachate and Runoff from storage of waste

Improper storage of waste until processed may result in leachate and runoff containing organic material (biochemical oxygen demand (BOD), phenols, nitrates, phosphorous, dissolved metals and other contaminants.

- The material processing or storage areas of the facility should have a leachate barrier system that forms a secure barrier between the groundwater, soil, and substrata and the composting or stored organics, as well as systems for collecting and treating leachate;
- For anaerobic digestion, maximize recycling of wastewater to the reactor;
- Measure total organic carbon (TOC), chemical oxygen demand (COD), nitrogen (N), phosphorus (P) and chlorine (Cl) levels in the inlet and outlet flows from an anaerobic digester.

The risk will continue over the duration of the project, is local to the pilot area, has a low likelihood of occurrence (good practice is to store waste in an area with impermeable flooring). The risk is therefore considered to be of low magnitude.

Since the sensitivity of the receptor (water quality) is considered medium, the overall impact is considered to be low.

The impact significance on groundwater from decentralized composting is Low.

6.4.4.2 Visual impacts of decentralized composting

The treatment activities can be a nuisance to the guests and produce negative visual impacts in the resort areas if not appropriately located.

[24] Exact design and technology is not known. Technology specific impacts need to be reviewed once known. Impacts assume vessel fermentation process that produces biogas and compost as a biproduct, since composting is prohibited by law within residential area premises.

The risk will continue over the duration of the project, is local to the pilot area, has a low likelihood of occurrence (assuming a suitable area is allocated to it) but is irreversible. The risk is therefore considered to be of medium magnitude.

Since the sensitivity of the receptor (visual impact) is considered high, the overall impact is considered to be medium.

The impact significance on visual impact from decentralized composting is Medium.

Visual impacts can be minimized by strategic selection of location within the hotel appropriate vegetation and landscaping features. The option of decentralized composting is generally ideal in hotels with waste water treatment operations.

6.4.4.3 Risks of Fire

Under certain conditions, biogas in combination with air can form an explosive gas mixture. The risk of fire and explosion is particularly high close to digesters. It can occur because of a gas leak, creation of an explosive zone, welding, clogged or frozen pipes or others.

The risk will continue over the duration of the project, is local to the project area, has a low likelihood of occurrence but is irreversible. The risk is therefore considered to be of medium magnitude.

Since the sensitivity of the receptor (health and safety) is considered high, the overall impact is considered to be medium.

The overall impact significance on fire from decentralized composting is Medium.

6.4.5 Negative Displacement Impacts on Affected households – Ethnic Groups (Bedouins)

(i) Risk of Economic Displacement of Bedouin Community as a result of composting Organic Waste (Livelihood)

According to Standard 5 of the UNDP SES, Economic Displacement occurs when individuals or communities are fully or partially restricted in their access to land or resources that are important to their livelihoods and economic well-being.

There are identified risks of economic displacement of Bedouin community as a direct result of composting organic waste. When interviewed, both the MBT facility and the Bedouin communities have assured the fact that there is an informal understanding between different actors (i.e., Hotels, MBT facility) and the Bedouins in their access to organic waste. In the case of composting Organic Waste, Bedouins will either no longer have access to organic waste or not in the same quantities as prior to composting activities. However, these risks are only limited to their access to resources and not land.

Composting waste activities in hotels could affect the organic waste stream going into the Bedouins' livelihood in terms of reducing the organic waste they use for livestock, which is their main source of income. Upon consultations, Bedouins have already shared their corrective action when organic waste was largely affected in terms of quantities during the Covid-19 Pandemic,

where they had to use other materials such as cardboard for feeding livestock which is an unsustainable practice. However, the risk of economic displacement still upholds.

Accordingly, the impacts of Economic Displacement of Bedouin Community as a result of composting Organic Waste on Bedouin livelihood is High.

Risk of Economic Displacement (Cart owners)

According to consultation activities carried out, there are 5 cart owners[25] from the Tahrir area Bedouin Community, who collect rejected material from MBT facility to be sent to the landfill area with the consent of the MBT facility owner. The driver of the cart observed by the Consultant at the landfill appeared to be a teenager. They gather materials such as copper and bread that is not reclaimed for recycling/treatment purposes. The economic risk is linked to the recyclables and livestock due to improvements of the waste stream, meaning that due to the project activities the materials and waste types that they collect might be reduced and/or limited which would then limit their economic benefit.

The actual list of affected people, affected household, average income, age, literacy level and ethnicity and household profile however has not been identified because the consultant interviewed a small sample size. However, the risk of economic displacement is not expected as the planned workstream will not change the waste composition of the recyclable stream reaching the MBT plant, but will deliver the same constituents in a segregated form. Moreover, the bread quantity is sufficient in the waste stream from residential areas.

Avoidance measures have been proposed to ensure no impact arises to the cart owners as a result of the project.

Accordingly, the impacts of Ecoomic Displacement of Cart owners as a result of the workstream on cart owners livelihood is Medium.

6.4.6 Risk of Economic displacement as a result of introducing new companies in collection process on Bedouin livelihood

Two new Contractors (Beah and Green Planet) have been awarded a contract for collection and transport of waste in Sharm El Sheikh. It was agreed however, that these services will be carried out through the current collectors. Therefore, the new collection setup will have no impact on the Bedouin collectors' livelihood.

Accordingly, the impacts of introducing new companies in collection process on Bedouin livelihood is Insignificant.

6.4.7 Risk of Vulnerability for Affected households

Vulnerable groups are groups who may be disproportionately affected by the project activities or risk being marginalized further by resettlement. These particularly include: (i) female headed

[25] Number is based on family interviews and landfill/MBT manager. The number of families to which they belong has not been identified. Further consultations needed.

households without support; (ii) disabled household heads; (iii) households identified as falling within poverty range; (iv) children and the elderly households with no other means of support.

The number of affected households has not been identified.

The types of potential displacement are summarized below:

Table 24: Types of potential displacement

Activity	Type of economic displacement / impact of loss	Impact source and category
Source Separation (increase separate collection)	Loss of donkey cart owner access to unwanted recyclable materials and other bread crumbs and will reduce their income.	Diversion of unwanted recyclable materials from the landfill will reduce the potential income of donkey cart owners and will require that they find an alternative livelihood activity to compensate for the activity.
Options for best treatment of separate collected organics- Decentralized /Centralized Composting	Loss of Bedouin community's access to buy organics used for feeding their livestock.	Reduced organic material available will mean that Bedouin communities benefiting from the organic waste will need to find an alternative feed for their livestock.
	loss of business opportunity to sell organic waste to other Bedouins	Truck owner Bedouins will no longer be able to acquire organic waste from the hotels which will reduce the potential income from selling it to other Bedouins.

The impact of economic displacement from composting is **high**.

6.4.8 Risk of Physical Displacement

According to UNDP SES standard 5, physical displacement often is involuntary whereby people are obliged to leave their homes or places of habitual residence but may also involve voluntary relocation[26]

No physical displacement of people is anticipated in any of the project's activities. As aforementioned in the Social Baseline, the Bedouins of Tahrir are nomads, and physical displacement is not forced whereas voluntary based of the interviews done by the consultant. However further consultations are needed in order to gather more information on the matter. Furthermore, the community will not be forced to displace or relocate their habitual residencies

[26] UN Office of the High Commissioner on Human Rights and UN Habitat, Forced Evictions, Fact Sheet No. 25/Rev

because of the project's activities. Their relocation is voluntary and primarily due to cultural and geographical reasons.

Accordingly, the impacts of physical displacement on Bedouins in Insignificant.

6.4.9 Tension Risk between stakeholders because of composting organic waste

As aforementioned in the risk of economic displacement, there is an informal understanding and contract between facilities and the Bedouin community in Sharm el Sheikh. The latter take (not purchase) the organic waste from the former to sustain their livestock breeding. During the site visit and through the interviews done with multiple stakeholders, some results and answers highlighted the mutual benefits between the Bedouin community and other entities. Bedouins have been a part of the Sharm el Sheikh community for a long period of time and facilitate different services. For instance eng.Ibrahim the owner of Zahrit Ganoub Sinaii is a part of said Bedouin Community. Due to these reasons any risk of impact on their livelihoods might result in tensions between the different communities and facilities.

In the case of composting waste in hotels, hotels are one of the main sources of organic waste for Bedouins, any activity of waste composting would reduce the organic waste flux going to Bedouin communities as explained in the economic displacement section and would therefore translate into a threat for Bedouins resulting in rising tensions.

The tension risk as a result of economic displacement from organics composting is **high**.

Table 25: Impact Significance

Impact	Magnitude						Receptor Sensitivity		Impact Significance
	Duration	Phase	Spatial	Likelihood	Reversibility	Impact's magnitude	Receptor	Sensitivity of Receptor	
Improper design of pilot segregation of the 20 hotels activity	Low	Design	Low	Medium	Yes	Moderate	Baseline Information	High	Moderate
Risk of business as usual	High	Operational	High	Medium	Yes	Major		High	High
Ambient air emissions for decentralized composting	High	Operational	Low	Low	Yes	Minor	Air Quality	High	Moderate
Leachate and Runoff from storage of waste from Composting	High	Operational	Low	Very Low	Yes	Minor	Ground water	Medium	Minor
Visual impacts of decentralized composting	High	Operational	Low	Low	No	Moderate	Visual	High	Moderate
Risks of Fire from composting	High	Operational	Low	Low	No	Moderate	Community H&S Workers H&S	Medium	Moderate
Negative Displacement Impacts on Affected households – Ethnic Groups (Bedouins) as a result of composting	High	Operational	Medium	High	No	Major	Bedouin Community	High	High
Economic Displacement (Cart owners)	High	Operational	Medium	Low	Yes	Negligible	Cart Owners	Low	Insignificant
Economic Displacement as a result of introducing new companies in collection process on Bedouin livelihood	High	Operational	NA	Low	Yes	Negligible	Collection Companies	Low	Insignificant
Risk of Vulnerability for Affected households	High	Operational	Medium	High	Yes	Major	Donkey cart owner Bedouin Organics Consumers Bedouin Organics Traders	High	High
Risk of Physical Displacement	NA	Operational	NA	NA	NA	Negligible	Community	Low	Insignificant
Tension Risk between stakeholders because of composting organic waste	High	Operational	Medium	High	No	Major	Livelihood	High	High

7 Mitigation Measures

7.1 Mitigation of risk from improper design of pilot segregation of the 20 hotels activity

Measures to mitigate the risk of improper design of pilot project include:

- Design training programs such that both theoretical training and on the job training are included. This will help raise the staff appreciation of the process, educate them of the cruciality of the process, prepare them for the exercise and ensure adherence during the pilot project.
- Choice of facilities need to take the following into consideration:
  - space availability for composting/biogas vessel
  - current level of segregation
  - scale of the hotel waste generation
  - Organizational HSE/waste management operational policies and procedures of the establishment
  - Opinions of operators on the quality of delivered segregation by the establishment
- To ensure consistent monitoring programs across the facilities, a training for trainers program needs to be put in place to ensure that the chief implementers (head chef or equivalent) are on the same page with regards to the project.

Implementing the mitigation measures will result in a **minor** residual impact

7.2 Mitigation of risk of business as usual

The project has been designed to eliminate such risks by :

- Complementing the pilot by training programs.
- Design of the program with several levels of embedded controls and accountabilities, namely, a chief officer within each hotel who will be responsible for the segregation process followed by the waste operator's contractual agreement who is responsible for the safe collection, transport and safe treatment of the waste.

7.3 Mitigation of composting risks

7.3.1 Ambient air emissions

To avoid releases to the air, it is necessary that the vessel is a closed system with an appropriate exhaust air collection device. It is also necessary that regular inspections and maintenance is carried out.

Implementing the mitigation measures will result in a **minor** residual impact

7.3.2 Leachate and Runoff from storage of waste

To avoid harmful leachate and runoff from waste storage, the following needs to be carried out:

- The material processing or storage areas of the facility should have a leachate barrier system that forms a secure barrier between the groundwater, soil, and substrata and the composting or stored organics, as well as systems for collecting and treating leachate;
- For anaerobic digestion, maximize recycling of wastewater to the reactor;
- Measure total organic carbon (TOC), chemical oxygen demand (COD), nitrogen (N), phosphorus (P) and chlorine (Cl) levels in the inlet and outlet flows from an anaerobic digester.
- Operate an anaerobic digester under thermophilic digestion conditions, in order to increase the pathogen destruction, biogas production rate (hence higher energy recovery) and the retention time ·
- Maintain ideal composting conditions such as Carbon: nitrogen (C:N) ratio, Moisture content, Balance between particle size and void space to promote rapid decomposition, Optimum temperature levels to ensure complete pathogen destruction

Implementing the mitigation measures will result in a **minor** residual impact

7.3.3 Visual impacts of decentralized composting

Visual impacts can be minimized by strategic selection of location within the hotel. The option of decentralized composting is generally ideal in hotels with waste water treatment operations.

need to be minimized with appropriate vegetation and landscaping features.

Implementing the mitigation measures will result in a **minor** residual impact

7.3.4 Risks of Fire

To eliminate the risks of fire, the following needs to be carried out:

- Collect biogas for use or treatment (e.g. energy recovery or flaring); ·
- Provide a fire alarm system, including temperature sensors in the waste being treated;

Implementing the mitigation measures will result in a **moderate** residual impact

7.3.5 Mitigation measures for Impacts on Affected Households and vulnurable households:

(i) Mitigation to the risk of Economic Displacement of Bedouin Community as a result of composting Organic Waste (Livelihood)

Unlike in normal conditions, where livelihood conditions considerations are made before and after displacement to appropriately suggest ways to replace lost income, it should be noted that replacing the lost income from waste activities with an equivalent income from a formal job is unlikely for Bedouin communities due to their cultural norms . The following is recommended for mitigation:

1. This impact will only be applicable if the organic stream was entirely withheld from the Bedouins. Avoidance of this impact will therefore be the assistance from the project to allow people who belong to ethnic groups (Bedouins) to continue benefiting from organic waste, i.e. the project will enhance the efficiency of utilization of organic waste, however Bedouins will

have access to the needed organic waste and only carry out composting of excess that is not needed. This mitigation measure should be developed in such a way that it responds to the requests of the project affected people during consultations and ensure that they :

- do not suffer adverse impacts as a result of the project activities
- Continue to receive organic waste in line with their cultural and social norms. However, the project developer will consider upcycling of organic waste activities as prior treatment and drying of waste to allow safe handling of the waste as discussed in section 4.2.1.2.

Further details on the stakeholder engagement are found in the ESMP chapter.

2. Develop and implement a good communication and accessible grievance mechanism for community members to address any complaints.
3. Provide them with healthcare knowledge as well as occupational safety while acquiring organic waste from different facilities (hotels and MBT)

If properly implemented, the residual impact will be **Insignificant**.

(ii) Mitigation to the Risk of Economic Displacement (Cart owners)

According to the workstream, segregation will be carried out from the source. To mitigate any impacts on the cart owners, it is necessary that they are allowed to receive the same segregated waste either directly from the hotels or from the MBT plant.

(iii) Risk of Economic displacement as a result of introducing new companies in collection process on Bedouin livelihood

No mitigation required as no economic displacement will result from the project activities on current collectors.

(iv) Mitigation of Risk of Vulnerability for Affected households

Mitigation of vulnerability for affected households can be mitigated by avoiding economic displacement as described in this section.

If properly implemented, the residual impact will be **Minor**.

7.3.6 Tension Risk between stakeholders because of composting organic waste

Tension risks are secondary to Economic Displacement of Bedouin Community as a result of composting Organic Waste (Livelihood) and will only be applicable if the organic stream was entirely withheld from the Bedouins. Therefore, the same mitigation measures hold, namely:

1. Assistance from the project to allow people who belong to ethnic groups (Bedouins) to continue benefiting from organic waste, i.e. allow them to continue obtaining organic waste from the hotels and only carry out composting of excess that is not needed. This mitigation measure should be developed in such a way that it responds to the requests of the project affected people during consultations and ensure that they:
   - do not suffer adverse impacts as a result of the project activities.

- Continue to receive organic waste in line with their cultural and social norms. However, the project developer will consider prior treatment and drying of waste to allow safe handling of the waste as discussed in section 4.2.1.2.

Further details on the stakeholder engagement are found in the ESMP chapter.

2. Develop and implement a good communication and accessible grievance mechanism for community members to address any complaints.
3. Provide them with healthcare knowledge as well as occupational safety while acquiring organic waste from different facilities (hotels and MBT)

8 Participation of stakeholder groups and public consultation

The chapter on the community engagement process aims to shed light on the main consultation and community participation activities, present the results of these activities, in addition to determining the accuracy and reliability of the data collected as the involvement of stakeholders is an important and integral part of the environmental and social impact assessment. Through the various consultation and participation activities that were conducted, the task forces recorded the different reactions of the stakeholder groups to the current project that will be presented in this chapter.

8.1 Objectives of the consultation process

The objectives of the various consultation activities can be summarized as follows:

- Identify the relevant groups of the project and suggest their possible roles.
- Disseminate comprehensive information about the project to enable stakeholders to identify their interests, needs, and recommendations.
- Listen to and record the comments, ideas and interests of the concerned groups for follow-up.
- Document the views of stakeholders and enhance environmental and social impact assessment accordingly.
- Identify the most effective communication channels that support ongoing dialogue with the community.
- Avoid any misconceptions about the project and manage expectations properly.

8.2 Definition of the groups involved

The first step in the process of engaging the groups involved is to identify them, i.e. to determine who are the groups involved for the project and which groups can be categorized under. The most important thing is to identify representatives of the groups concerned for consultation activities. smoothly. These representatives not only communicate valuable information to the project, but also act as a communication channel to communicate information to large numbers of interested groups and receive information from them.

8.3 Methodology and activities of the consultation process

The study team adopted the participatory rapid research methodology to include different groups of society in a short time. The study team conducted a site visit to the project to identify the targeted areas, which were mainly represented in the city of Sharm El-Sheikh Wadi Al-Khanasir, in which the project area is located. To date, the consultants have held the following consultative activities:

1- On November 29, 2022, the exploratory phase began with a site visit to the waste treatment facility in cooperation with the implementation officials, the owner of the solid waste sorting and recycling plant in Al-Khanasir from Zahrit Ganoub Sinai Company.

2- This was followed by a consultation with different stakeholders as Ruwaysat traders, waste collectors, and hotel representatives which lasted until December 1, 2022.
3- The study team visited Wadi Al-Shorafa, and the Tahrir Valley (Bedouin communities) to identify the different groups involved.

Figure41 : Photos of project site visit

An agenda has been prepared for the participation of the different concerned groups and the consultation activities that were conducted during December 2022. At this stage , the study aims to disseminate comprehensive information about the project to enable the concerned groups to identify their concerns, needs and recommendations.

1. The task force divided the social activities into:

- data collection
- Consultation activities on the project.

All activities conducted have been documented with photos and lists of participants to ensure an appropriate level of transparency.

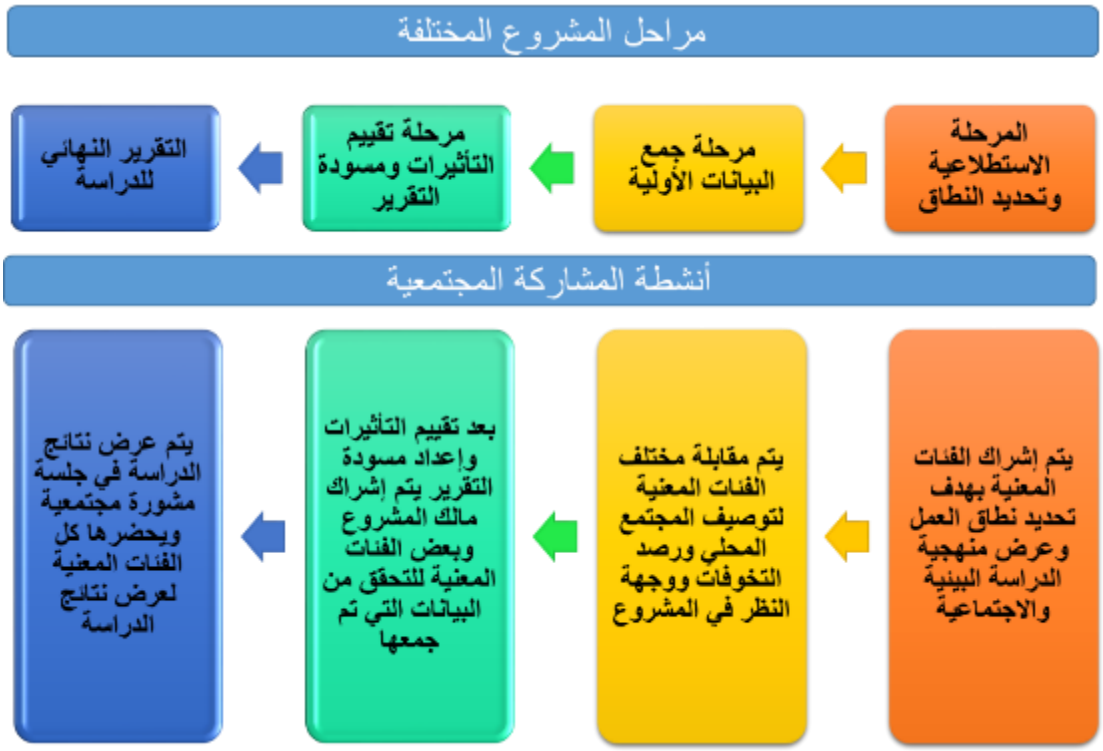

Figure42 : Community Consultation Methodology26

8.4 Consultation activities with project stakeholders during the scoping and data collection phase

Community consultation activities included two phases, namely the scoping and data collection phase. Then followed by the public disclosure. The first phase was implemented in December, 2022. The public disclosure will take place by making the ESIA available online.

Table 27: Summary of consultation activities in the project area during the scoping and data collection phase

The Collection	Category	genre	
		males	females
Zahrit Ganoub Sinai Company	Owner of Zahrit Ganoub Sinai Company	1	0
	Sorting and Recycling Plant Manager	1	0
	Owner of a collection company from Zahrit Ganoub Sinai company	1	0
	Head of Waste Collection Foreman at Zahra Company	1	0
Ruwaisat Scrap Trading Area	Scrap dealer	1	
Locals	A group of Bedouin women – a group of Bedouin men	2	6
Government Departments	Director of Environmental Affairs	1	0
Total		8	6

The following is a collection of photographs documenting those meetings that took place.

Figure43 : Interview with Badawi - owner of Zahrit Ganoub Sinai (Bedouin house of mud bricks) in Wadi Al-ShorafaZahrit Ganoub Sinai

Figure44 : Interview with some Bedouin women and girls (in a Bedouin tent) in Wadi Al-Shorafa

Figure 45: Zahrit Ganoub Sinai Owner – Factor Manager

Figure 46: Scrap Store Owner – Social Consultants

Figure 47: Zahrit Ganoub Sinai MBT Plant

Figure 48: Bedouin women (Bedouin nests in the desert) in the liberation valleys

Figure 49: Bedouin Nests - Wadi Tahrir

Figure50 : Sharm El Sheikh Transport Truck to Waste Recycling Plant

Figure 51: Recycling and compaction of waste in the factory

Figure 52: Compost – Organic fertilizer in the factory

Figure53 : Old sanitary landfill next to Zahrit Ganoub Sina MBT plant

Figure 54: Part of the social life of the Bedouins in Wadi Tahrir

Figure 55: Badawi Supermarket in Wadi Al-Khanasir

Figure 56: Bedouin housing in Wadi Al-Shorafa Al-Sharqiya

Figure 57: Compost Making Machine

Figure 58: Sanitary Landfill in Sharm El Sheikh

Figure59 : Bedouins Electricity Use in Tahrir Valley (solar energy)

Figure 60: Drinking water tanks in Wadi Tahrir

8.5 Results of consultation activities

The following table illustrates the comments and recommendations made by some stakeholders for the project during the scoping and data collection phase:

Table 28: Summary of discussions in the scoping phase and adjustments to the study due to those recommendations

Subject	Details	Comments
Nature of work	Work Information and Basic Data for Bedouins	According to Ahmed Eid (Badawi) and his son Sami Ahmed Eid - holds a preparatory - original origin: Saint Catherine - lives in the region from 14 years, to the displacement from Saint Catherine to Sharm El-Sheikh because of the lack of rain on the mountains, either in Sharm El-Sheikh there is food for sheep, rain and herbs, he works as a shepherd of goats, sheep and camels (sale - grazing - breeding) and is the source of livelihood, the wife takes care of goats and camels and is responsible for raising them and sometimes Selling them, the husband collects sheep food from surplus food from hotels or from the dump of the South Zahrit Ganoub Sinai Company or leftover food (organic food - grass - agriculture - cardboard - vegetables) as a free of charge according to customary agreement and customary law in the tribal society to avoid problems and social distancing and to help each other, and buys from hotels leftovers of food, he cannot dig from the city is forbidden. Ibrahim, the owner of the factory, said that most or 90% of the Bedouins work in the craft of grazing, 10% in safari, and a small percentage in the transport of goods, where most Bedouins own semi-transport cars. The testimonies of one of the Bedouin women in Wadi Al-Shorafa that most of them work in sheep breeding, where all women work in raising sheep, camels, birds and sometimes selling. Testimonies of one of the Bedouin women in Wadi Al-Shorafa that they do not have workoutside the house and do not go out of it

Waste Recycling Plant in Khanasir	Factory components and how to operate it	Ibrahim Hamida, owner of the Zahrit Ganoub Sinai Factory, added that the factory (South Zahrit Ganoub Sinai Company in the Al-Khanasir area) is a dump and recycling factory (plastic - compost) and is 35 km from the city of Sharm El-Sheikh. The factory is a European grant with outputs of about 400 tons in the summer in a month (7-8-9) and according to Russian and Ukrainian tourism and domestic tourism. An additional period was submitted and the contract was extended to collect investments (solid waste) on its expansion to a factory with a new line and a new development to be in line with the amount of waste, and the efficiency of the factory was raised by about one million pounds before and a monthly rent is paid to the state about 115 thousand pounds. The factory is about 35 km away from Bedouin communities (valleys) such as Wadi Al-Shorafa in the safari sector, and about 2 km from **Wadi Al-Tahrir**. There are no residential communities around the factory, there is only a mountain and a desert, there are no monuments near the factory, there are no companies near the factory, the state chose the factory in a remote place far from everything and it belongs to the armed forces. There are no factories in Sharm El Sheikh, and therefore there is no industrial waste, there is no separation from the source Combest work from crops in Sharm El-Sheikh (Najila - Hashish) but camels eat from the plant There is no hazardous waste in the factory, there are no leaky liquids, and there is no demolition and construction waste. **The old landfill was** a quarry and is backfilled, in the past it was a dump in Ruwaisat and close to the residential block, then the waste was transferred to the factory of the pigs of 20 years and the area of the landfill and the dump and the factory kilo * 500 and the state considers them one place, the new sanitary landfill was not received from the state next to the factory **Components of the vault** x 2 loaders - x 2 tippers **The number of cars** that collect waste is about 50 large jumbo trucks - tipper - Mercedes The Nabasheen are banned in all the city of Sharm El Sheikh due to the situation and social nature .

Subject	Details	Comments
		Factory Components • Sorting itinerary • 2 modern plungers • Compost Machine • sieve • Schlider (to take advantage of agricultural waste) and the use of rams for the price of the equipment (12 million), which is ultimately a cosmetic machine and contributes to the cleanliness of the environment . A **hangar** was made for not flying the bags (not yet completed) to unload the waste as a result of combining it with two sorting and newer lines than the existing one. The factory works one shift and according to the percentage of occupancy. The snappers and waste fire were completely controlled from about 4 years from the time of operation of the plant. Hiring Hotels • Contracting with hotels on two entrances morning and night (important for the hotel to dispose of waste constantly) The average hotel is 500 kilos per day from 300: 500 rooms • The hotel contracts to remove waste according to the number of rooms (500 rooms) 8000 pounds per month (and give labor a symbolic wage and have the right to dispose of organic waste) and is sold to the Bedouins .
Basic Facilities	Nature of basic facilities	Report Ahmed Eid (Badawi) Basic facilities for Bedouins • Sanitation through sewers • Water from the governorate comes in free vehicles for the Bedouins - and drinking water is purchased from Sharm el-Sheikh • The main electricity is from Sharm El Sheikh Basic Facilities in the Factory • Sanitation through sewers • Water from the governorate comes in carts free of charge for the Bedouins – drinking water is purchased from Sharm el-Sheikh • The main electricity of Sharm el-Sheikh city • There is no natural gas

Subject	Details	Comments
Transportation for Bedouins	Nature of transportation	Toyota cars belong to the Bedouins, but there is no public transportation so they move together in their own car, the children walk to school for at least an hour.
Health	How to treat Bedouins from diseases and widespread diseases	According to Ahmed Eid (Badawi) that there is a health unit **in Wadi Mander**, Al-Haram International Hospital, herbal treatment (for colic - cough) and honey. The testimonies of one of the Bedouin women in **Wadi Tahrir** that in the event of illness of any child, they go to the health unit through a neighbor's car. There are also no widespread diseases, herbal treatment is rare to find a diabetic, and there are no cancerous diseases, virus C or chronic diseases. There are no smells coming from the dump in **Wadi Al-Shorafa** , the flies are present in the valleys because of the spread of the rest of the food provided to sheep and camels on the ground to dry and sell it to their neighbors dried food for sheep. Health status of factory workers The health situation is good, there is no infection with any diseases as a result of the lack of pollution because (the hotel starts producing waste after dinner, so the waste did not last 3 hours and was not infected with any bacteria or pollution).
Population	Bedouin population	One of the Bedouin women in Wadi Tahrir reported that the number of houses is about 20: 30 houses.
education	Bedouin education	Ahmed Eid (Badawi) said that most of the population is children with basic education (primary - preparatory), while adults are uneducated, at Wadi Mander School (primary - preparatory - commercial secondary), there is a dropout from education from the primary and preparatory stages. Testimonies of one of the Bedouin women in Wadi Tahrir that the children go to school, but the school is a very large distance from their homes, so some children drop out of education and do not go to school, and due to their movement from one place to another and over the mountain as well.
Nature of the residence	The nature of Bedouin housing	Ahmed Eid (Bedouin) said that the nature of the Bedouin housing (nest - two rooms with mud bricks one floor - tent - over the mountain to escape from the rain or where there is grass for sheep) where the Bedouins move a lot in the desert or mountains. Workers live in the Ruwaisat area in Sharm El Sheikh.

Subject	Details	Comments
		One of the Bedouin women in Wadi Tahrir said that their houses are two rooms with mud bricks. disposal of residues is carried out by burning them; The testimonies of one of the Bedouin women in Wadi Al-Shorafa that they buy their clothes from Sharm El-Sheikh, including a woman who has a sewing machine that she uses to repair clothes and adjust them for others.
Environmental situation	Environmental situation in the factory area	No pollution, car exhaust (this is due to traffic jams and humans), dust, smoke There is no wind rotation. Oneof the women of Al-Bid and Wadi Al-Tahrir testified that the use of solar energy to charge phones only and its size is small.
Land and housing uses	Land and housing uses in Sharm El Sheikh	Ibrahim, the owner of Zahra factory, said that the factory is rented by the state . Bedouin communities put a hand they change the dwelling from time to time, live anywhere, some began to settle because of the entry of electricity to the housing. There is no land purchase now. Prices per square meter in Ruwaisat area 8000 pounds, in Al-Nour district about 7000 pounds . The prices of residential apartments ownership from 350,000 - million pounds, depending on the place and areas . The rent of apartments in Ruwaisat is different from Al-Noor district . Shops rent 20000 per month in Sharm El Sheikh .
Occupational Safety and Health Procedures	Occupational safety and health procedures for workers on site	Ibrahim, the owner of Zahra Factory, reported that the workers were offered the following: • Simple occupational safety and health measures (gloves - fire extinguishers - mask - boots) • Providing paid housing by Zahrit Ganoub Sinai Company • Providing transportation to and from the site
Complaints System	Complaints System for Workers	Ibrahim, the owner of Zahra Factory, said that there is no complaints system for complaints by phone or by speaking directly through the foreman.

Subject	Details	Comments
Working conditions of workers in the factory	Conditions of workers on the site and the facilities provided to them within the site and their conditions within the community, housing and their way of living	Ibrahim, the owner of a Zahrit Ganoub Sinai, said that most of the workers are from the governorates of Upper Egypt (Minya - Assiut - Sohag - Qena). Housing is provided for workers in Sharm El Sheikh from the Zahrit Ganoub Sinai Factory . Transportation to and from the factory is provided daily by the factory car because there is no transportation policy. The number of workers in the factory according to the percentage of occupancy of the country from 100-200-250 individuals per month , while the workers who collect from hotels are fixed . According to the environmental official in the governorate , it is possible to work in the project about 60 people .
Child labor	Child Labor in Zahra Company	Ibrahim, the owner of a Zahrit Ganoub Sinai Company, said that there is no child labor in the MBT without a national number because of the police campaigns on the road .
Economic situation	The economic situation of the Bedouins	Ibrahim, the owner of a Zahrit Ganoub Sinai, said that the economic situation of the Bedouins is average, selling Bedouin sheep to butchers in the city and on holidays, weddings and births. All family members work in herding, raising and selling sheep and camels . The average family income is 4000 pounds . Bedouins eat from the birds they raise, livestock they raise and bake bread themselves, they only buy from the city simple things like vegetables and flour
Effects	Antiquities in the factory area	Ibrahim, the owner of a Zahrit Ganoub Sinai, said that there are no traces in the factory area. The nearest monuments in Tur Sinai are 100 km away.
Environmental & Social Benefits	Environmental and social benefits of the project	• Bedouins: Provide food for goats from the factory for free. Environmental advantages of the project • Do not burn waste as before – burying waste in landfill with sand through a loader – organic waste is taken by Bedouins as food for sheep – plastic, bags and cardboard are pressed with a press • There is no liquid (leachate) in the waste and the rest of the waste is buried in the landfill • Put a transplant around the plant sift

Subject	Details	Comments
		According to the environmental official in the governorate, Sharm El-Sheikh is far from this social impact, there are more than 100 cars working in collecting waste from hotels, especially for Bedouins (tribes)
The presence of NGOs in Sharm El-Sheikh	The extent of the participation of NGOs in the waste system	The owner of the factory needs to make a civil association, and does not know any civil society in Sharm el-Sheikh . According to the environmental official in the province, there are associations working in collecting waste, but they work in their surroundings only and eventually send their waste to the factory.
Transportation & Traffic		Ibrahim, the owner of Zahra factory, said that the traffic has a load ratio that is not counted, and certain procedures, specific numbers and certain dates. The main roads are good, but the methods of the vault and dump have many pistils. Solid waste is transported after sorting and compacting to recycling factories in Cairo, and the cost of transportation is large
Knowledge of Bee'ah and Green Planet And recycling companies Other		Ibrahim, the owner of a Zahrit Ganoub Sinai, said that they have not yet worked, they worked at theclimate conference, and they will work next April , and they are responsible for cleaning the streets and neighborhoods. The factory has a part of the cleanliness of streets and neighborhoods with the governorate. **HEPCA a** : Cleaning company in Hurghada - Cairo inthe sixth of October . There are no recycling companies in Sharm El Sheikh,but there are in Cairo, the tenth of Ramadan, the sixth of October and some governorates .
The extent of the presence of markets and shops among the Bedouins		The markets are only in Sharm el-Sheikh and there are no Bedouin communities around the factory. There are very small shops inside the residential houses at the Bedouins . The vegetable vendor passes once a week or twice, and the ladies buy everything they need .
Waste collection in Sharm El Sheikh		Ibrahim, the owner of Zahra factory, said that the Bedouins collect their waste every two weeks and send it to the waste recycling plant, and they take the leftovers from the waste

Subject	Details	Comments
		dump in the factory, and cardboard and paper are used as food for camels, goats and birds. The environmental official in the governorate stated that the city of Sharm El-Sheikh is divided into streets, neighborhoods, hotels, one industrial zone (industrial Ruwaisat), apartments, neighborhoods (streets - houses). The hotel is contracted with Bedouin companies with their car that collect waste and organic . The mountain contains bags according to the incoming air and wind directions in the month of 5-4-1-2 and the bags are collected every period, the wind does not have a specific direction. The environmental official in the governorate said that there is no sorting of waste in the street and whoever violates this is subject to imprisonment, as the governorate has followed a strict system in dealing with the waste system in Sharm El-Sheikh. There is **a diving association** that cleans the sea of plastic bags every 3 months and now 60% of the shops sell in cloth bags.
Solid Waste Prices		A ton of compost 17,000 pounds . The price of a kilo of iron is 10 pounds per kilo, the price of a kilo of plastic is 8 pounds per kilo, the price of a kilo of red copper is 150, the price of a kilo of plumbing copper is 110 pounds , and the price of a kilo of aluminum is 55 pounds per kilo
The nature of the work of scrap dealers	Collection Places Collection times	One of the scrap dealers in Al-Ruwaisat area reported that scrap is collected from hotels and companies, and collection and sorting is done in sorting places, and recycling is prohibited in the area because it is a natural reserve. Recycling is done in Al-Tur. Auctions are held in hotels to sell scrap and after purchase the sale is made in Cairo after the sorting process and iron and aluminum are recycled The exit of scrap from the city is done with a security permit and the approval of the factory is required

Subject	Details	Comments
Impact on the population	Are there any environmental or social impacts on the population?	According to the environmental official in the province, there are no effects on the residents of the area of the sanitary landfill, all Bedouin residents have a good economic condition and their homes near the landfill are for day stay only, but they have houses far from the sanitary landfill . There is no impact on the Bedouins, but they have a great benefit from the project because they do not take waste to feed the sheep (the smell is formed in the Bedouins because they take organic N).
Waste collection by companies	Are there companies that collect waste from residential blocks?	According to the governorate's environmental official, there is one company that collects waste from residential blocks, and the city council also plays the same role.
Waste Collection Company	Method of collecting waste - places - quantities	Magdy Marei Ali Saleh Al-Majd Company for Waste Collection said that contracting with hotels to collect waste (8 hotels) is collected from hotels to the factory, all waste is without sorting, as there is no sorting from the source. There are 4 cars to collect from the hotels the car is 6 meters. The collection takes place after dawn from 6 am to 10 am; the collection is done and the waste of houses is sent to the factory and organic to the Bedouins (the company's workers sort inside the cars) Ali Hamada, director of Zahra Waste Recycling Factory, said that some problems were encountered with the environment and local development.
Scrap quantities		About 30 or 40 scrap cars per month come out of the factory, the load of the car is 8 tons, if aluminum metals or copper are more than 8 tons.

9 Grievance Redress Mechanism (GRM)

The primary objective of this Grievance Redress Mechanism (GRM) is to establish a system to receive and facilitate resolution of the community's concerns and grievances about waste management and disposal in Sharm el Sheikh. The objective of a grievance mechanism procedure is to ensure that all comments and complaints from any project stakeholder are considered and addressed in an appropriate and timely manner.

Both UNDP and contractors (project implementers) must be committed to avoiding, reducing, limiting and, if necessary, remedying any adverse impacts caused by their activities on local populations and on their social and physical environment. One of the tools for identifying, preventing and managing unanticipated impacts is a Grievance Mechanism (GM).

The grievance mechanism will deal with suggestions, concerns, and grievances related to any issues arising from Project specific activities. The grievance mechanism is not designed to obstruct access to other judicial or administrative processes that are available under Egyptian law.

The objectives of implementing a Project GRM are:

- To ensure that all comments and complaints from project stakeholder groups or individuals are addressed in an appropriate and timely manner,
- Avoiding conflicts by implementing corrective measures for the negative effects that may result from the implementation of the project immediately, to maintain the continuity of the project and not to interrupt work,
- in addition to fulfilling the requirements of the lender, especially regarding sharing information, and establishing a clear and effective mechanism for managing complaints throughout the project implementation.

Improper management of the GRM during project activities can result in adverse impacts on project sustainability. It should be considered that complaints/ claims/ questions and suggestions that have not been responded/ answered or ignored have the potential to become problems and should, therefore, be addressed promptly. It is good practice to respond to community feedback through the relevant pillars of community engagement, such as disclosure and consultation. Combined with effective community engagement, a transparent and legitimate grievance mechanism that is a joint effort between contactors, project actors and communities can increase trust and improve communication.

This GRM was developed to align with the risk management objectives of UNDP and compliant with national and international standards especially the UNDP SES and best practices as set out by Good International Industry Practice (GIIP), and more specifically UNDP's Supplement Guidance: Grievance Redress Mechanisms, which describes basic principles the grievance mechanism should be built and evaluated upon it.

The importance of implementing a GRM comes as a measure to ensure that grievances are properly addressed promptly, that information is shared transparently, that emphasizes the project's accountability to the host communities. The GRMis a tool for engaging project affected

community members. In addition to supporting good relations with local communities, building trust between the Project and the stakeholders.

Therefore, the project should work on a comprehensive procedure of GRM; Adequate and appropriate information about the mechanism should be shared with the communities prior to the construction/implementation phase.

9.1 Grievance Redress Mechanism Principals

It is clear from the previous sections that the implementation of an effective Grievance Redress Mechanism should be based on a number of principles and standards, more specifically UNDP's Social and Environmental Management System Requirements in the most recent SES framework. In which UNDP ensures that several guiding principles should drive the design of GRMs. GRMs designed according to these principles are more likely to provide effective resolution of stakeholder grievances.

- **Legitimate:** enabling trust from the stakeholder groups for whose use they are intended and being accountable for the fair conduct of grievance processes. Accountability for ensuring that the parties to a grievance process cannot interfere with its fair conduct is typically one important factor in building stakeholder trust.
- **Accessible:** being known to all stakeholder groups for whose use they are intended, and providing adequate assistance for those who may face particular barriers to access. Barriers to access may include a lack of awareness of the mechanism, language, literacy, costs, physical location and fears of reprisal.
- **Predictable:** providing a clear and known procedure with an indicative timeframe for each stage, and clarity on the types of process and outcome available and means of monitoring implementation. In order for a mechanism to be trusted and used, it should provide public information about the procedure it offers.
- **Equitable:** seeking to ensure that aggrieved parties have reasonable access to sources of information, advice and expertise necessary to engage in a grievance process on fair, informed and respectful terms. Where imbalances are not redressed, perceived inequity can undermine both the perception of a fair process and the GRM's ability to arrive at durable solutions.
- **Transparent:** keeping parties to a grievance informed about its progress and providing sufficient information about the mechanism's performance to build confidence in its effectiveness and meet any public interest at stake. Providing transparency about the mechanism's performance to wider stakeholders, through statistics, case studies or more detailed information about the handling of certain cases, can be important to demonstrate its legitimacy and retain broad trust. At the same time, confidentiality of the dialogue between parties and of individuals' identities should be provided where necessary.
- **Rights compatible:** these processes are generally more successful when all parties agree that outcomes are consistent with applicable national and internationally recognized rights. Grievances are frequently not framed in terms of rights and many do not initially raise human rights or other rights concerns. Regardless, where outcomes have implications for

rights, care should be taken that they are consistent with applicable nationally and internationally recognized standards and that they do not restrict access to other redress mechanisms.

- **Enabling continuous learning:** drawing on relevant measures to identify lessons for improving the mechanism and preventing future grievances and harms. Regular analysis of the frequency, patterns, and causes of grievances; strategies and processes used for grievance resolution; and the effectiveness of those strategies and processes, can enable the institution administering the GRM to improve policies, procedures, and practices to improve performance and prevent future harm.
- **Based on engagement and dialogue:** consulting the stakeholder groups for whose use they are intended on their design and performance and focusing on dialogue as the means to address and resolve grievances. For an operational-level grievance mechanism, engaging regularly with affected stakeholder groups on the GRM's design and performance can help to ensure that it meets their needs, that they will use it in practice, and that there is a shared interest in ensuring its success.

9.2 Process for GRM Management

Step 1: Publicizing Grievance Management Procedures

An appointed Community Liaison Officer (CLO) will inform the local communities about this procedure, arranging face- to-face meetings at the following levels:

- Affected Community and Households (Tahrir Bedouin Community)
- Local administrations/ local NGOs; and
- Community sensitive areas, such as mosques, market areas, schools.

During the meetings, the CLO will explain how the procedure works. In particular, the information shall include:

- where, when and how community members can file complaints
- who is responsible for receiving and responding to complaints
- what kind of response complainants can expect from the contractor company, including timing of response
- posters in Arabic language, based on illustrations and easily understandable concepts

In addition to the explanation provided verbally, will provide the communities with printed materials to be affixed in prominent areas, providing the key facts about the mechanism and contact information, consisting in a dedicated phone number.

Communication and awareness raising activities regarding the Response Mechanism will be repeated in regular intervals.

Step 2: Receiving and Keeping Track of Grievances and Responses

- The complaint form should be signed and dated by the aggrieved person, and if he/she is unable to write, he/she should get help from the community/ CLO (if needed) to write

the note and mark the message with their fingerprint (optional). Individuals submitting comments or complaints have the right to request that their names be kept confidential, although this may mean that the person in charge of the complaint's mechanism is unable to provide feedback on how complaints are handled. However, anonymous complaints can be received and should be appropriately investigated and not ignored

Step 3: Reviewing and Investigating Responses

Complaint verification involves gathering information about the problem to determine its validity and to get clear and better understanding of the circumstances surrounding the problem and its consideration.

This process typically includes site visits, document reviews, meeting with the person making the complaint (if known and willing to be involved), and meetings with individuals and/or entities who can help resolve the issue.

Step 4: Developing Resolution Options and Preparing a Response

Complaints are classified into two categories: high level and standard (minor), each with its own procedures depending on the extent of the associated risks and impacts.

Minor complaints procedure:

This procedure is designed to resolve issues that do not require an on-site investigation, promptly and directly at the location where the complainant submits his request. In this case, the complaint receiving officer will interact with the complainant directly and promptly, provide the necessary explanations, and act accordingly. This will also include delegating the person responsible to resolve the complaint, in order to ensure a faster response.

It shall be promptly resolved by the relevant personnel within a maximum of 3-5 working days and shall be documented and archived in accordance with the relevant procedure. In case of extension, the complainant should be notified and informed of the reason behind it. However, the duration should not exceed a time limit of 10 days including necessary actions.

High level comments/complaints procedure:

They will be categorized as "high" cases that can fall under the following:

- Incidents that have caused or may cause significant harm to the environment, local workers from the surrounding communities, communities, or natural resources, including cases of gender-based violence
- If the grievances officer has already attempted to resolve the issue directly but no result satisfactory to the complainant has been obtained

The complainant directly requested an investigation;

The complaint does require careful research and investigation

Step 5: Monitoring, Reporting, and Evaluating a Grievance Mechanism

Once a resolution has been agreed upon or a decision made to closeout, the final stage is to implement the resolution, monitor outcomes, and close out the grievance. Closing out the grievance, therefore, occurs after the implementation of an agreed resolution has been verified.

Before closing out the grievance, the personnel in charge shall first verify with the complainant that the resolution has been effectively implemented, suggesting adjustments when necessary to ensure that the root causes of complaints are addressed.

The follow-up and monitoring procedures are based on the preparation of regular reports for the SRM, which is carried out through the regular documentation of all complaints and related data, with the aim of ensuring that all complaints are resolved/ dealt with in a timely manner to achieve compliance with environmental and social requirements.

Reports will be prepared on a monthly basis and submitted to the Project Manager, and on a quarterly basis and submitted to the lenders or upon request. The reports should provide an overview of the complaints/queries/comments received in relation to the implementation of the project activities. The contents of report are as follows:

- The received grievances during reporting period
- A list of summarized processed grievances
- Analysis of closed and unclosed grievances
- Recommendations

9.3 Key Performance Indices

Key Performance Indicators (KPIs) are quantifiable metrics that identify the performance of the management plan related to its requirements and objectives, which directs the management effort for improvement opportunities.

The following KPIs should be regularly monitored and accurately recorded to provide sufficient data for possible optimization of Stakeholder Response Mechanism :

- **Participation**: Percentage of grievances channeled through the Community' Grievance Mechanism. The target is to have all grievances addressed through the Community' Grievance Mechanism before complaints cause undue stress, reach the media or the courts.
- **Effectiveness**: Percentage of complaints receiving effective and timely response (target is 100%).
- **Resolution**: Percentage of complaints resolved in the first and second reviews. The target is to resolve at least 80% of complaints.
- **Recurrence Reduction**: Number of complaints by categories: environmental issues, influx of workers and the inconvenience of local communities, traffic congestion, misinformation or lack of information and behavior of employees or subcontractors. The target is to gradually reduce the number of complaints in each category by 50% 6 months. The

intention is to learn from grievances and respond to them in a manner that, over time, reduces their rate of occurrence.

- **Influence**: This indicator identifies policy or performance/conduct changes in contractor influenced by an evaluation of Grievance Mechanism indicators and analysis of grievances.

The KPI for grievances shall be set at 100% resolve rates for all valid grievance requests within the allocated timeframe. It shall be monitored on a quarterly basis.

9.4 Proposed Stakeholder Engagement Activities for the Tahrir Bedouin Community

Stakeholder engagement is an inclusive process that has been carried out throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project's environmental and social risks.

Stakeholder engagement is most effective when initiated at an early stage of the project development process, and is an integral part of early project decisions and the assessment, management and monitoring of the project's environmental and social risks and impacts.

The objective of engagement is to provide local communities that are directly affected by the Project and interested stakeholders with access to timely, relevant, understandable and accessible information, in a culturally appropriate manner, and free of manipulation, interference, coercion and intimidation. Additionally, to enable them express their concerns and worries through a grievance system.

9.5 Communications Method

After the first stakeholder engagement in chapter 5, the consultant recommends further stakeholder engagement activities to be done in particularly for the impacts concerning the Tahrir Bedouin Community and other stakeholders in order to assess and take into consideration their input and recommendations for the project workstream and activities.

However due to the nature of their Lifestyle as mentioned in the social baseline, it is important to note that only in person activities and communication methods are possible in order to ensure the presence of the Tahrir Bedouin community in all GRMs :

- Multi-stakeholder meetings where all key stakeholders are comfortable with this style; these depend on geography – a series of meetings in different locations will accommodate widely spread stakeholders such as the local units and environmental office, the Bedouin community of Tahrir, hotels and the MBT facility
- Key stakeholder interviews since identifying and consulting key individuals in communities, such as traditional leadership, religious or spiritual leaders, well connected/informed elders (as they hold historical knowledge), women or youth leadership, etc. may yield invaluable information that can be used for triangulation with other data. These interviews should

primarily focus on the Bedouin community of Tahrir and other Bedouin communities in Sharm el Sheikh whose main livelihood income is through livestock breeding.

- Series of workshops with meetings addressing specific issues (particularly relevant for specialist organizations and multi-sector projects) or where different stakeholder groups are expected to have varying interests and concerns.
- Focus group discussions are smaller and more specialized again; discussions with typically 8-15 people; useful where vulnerable groups are concerned since they may not feel comfortable speaking up in larger events. These need to be well facilitated, ideally by someone in the cohort in question. Interviews in the form of one-on-one interviews and private meetings, when this enables vulnerable and traditionally marginalized stakeholders to contribute more readily or feel safer doing so.
- Surveys can be conducted either as questionnaire-based surveys or in-depth interviews (in person or by phone) with identified key informants (many professional survey or polling companies have relevant expertise). Respondents should be given the option of remaining anonymous.

10 Environmental and Social Management and Monitoring Plan

The Environmental and Social Management and Monitoring Plans are presented in this chapter, and they reflect the implementation procedures and mechanisms for the mitigation measures and monitoring activities of the expected impacts discussed previously for the following:

Table 29: Proposed Waste Stream Impacts covered in the Environmental and Social Management

Location within Supply Chain	Project Activities/Intervention
Source (Hotels)	Training of the hotel's staff at source for consequent separate collection and monitoring of volumes and masses
	Source Separation (increase separate collection)
	Record masses and volumes of the separated fractions
Collection & Transport	New contracts with collection companies (Be'ah and Green Planet) to secure the complete fraction-separated collection
MBT Facility	Capacity building activities (in-depth waste management training for the Bedouin community managing the Wadi Khanasir area)
	Optimization of the sorting facility at Wadi Khanasir & detect & fix deficits (operative/technical problems)
	Composting process optimization (after hand sorting: Function of the turning machine, water supply, last separation by the compost screen, quality and application of the compost)
Monitoring Activities	Install proper working organization of public waste management in Sharm El-Sheikh.
Further treatment	Monitoring and optimization of further treatment of other waste fractions
	Options for best treatment of separate collected organics-Decentralized /Centralized Composting

The ESMP assigns certain tasks for different stakeholders according to their roles and responsibilities in the project.

10.1 Institutional Setup of ESMP[27]

10.1.1 Project Manager

The Project Manager (PM) has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Project Board. The Implementing Partner appoints the Project Manager and a Local Project Coordinator, who both must be different from the Implementing Partner's representative in the Project Board. Both PM experts will be having a significant technical experience related to the scope of the project in addition to strong project management skills. The PM will provide overall technical direction for delivery of key outcomes as part of the functions. In addition, s(he) will inform the Project Board and the Project Assurance roles of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted. The PM will report on the implementation of the ESMF. The Project Manager will be located in an office provided by EEAA in Cairo, will have to travel to the project area occasionally, and will provide the managerial leadership for the project, working closely with institutions represented in the PB, the Technical Working Groups and key stakeholders. A Project Administrator will be stationed in the PMU and will provide support to the Project Manager in management and financial administration/accounting of the project as well as provide logical support to technical components of the project.

10.1.2 Project Management Unit

The PM will be assisted by a *Local Project Coordinator* in Sharm El-Sheikh, will be responsible for day-to-day coordination of PMU office staff and field experts, and with a support of a local admin person, ensure regular communication with local beneficiaries and stakeholders. The *Project Management Unit (PMU)* will provide the part-time effort of multiple staff members in logistics, procurement, and financial management at the request of the Project Manager. All work of the PMU will be carried out in accordance with UNDP's requirements for Social and Environmental Standards, and associated guidelines.

Other core staff includes a part-time Chief Technical Adviser (CTA), responsible for guiding the overall technical direction of the project. In addition, the project will employ national and international specialists in different fields to achieve different project outputs.

10.1.3 Local Project Coordinator

The Local Project Coordinator will supervise several waste Experts. The local project coordinator will make sure that the ESMP is soundly implemented.

[27] Section obtained from the ESMF

The local project coordinator will be coordinate with the different experts/consultants to carry out the following activities:

- Design training programs to raise the hotels' staff appreciation of the process, educate them of the cruciality of the process, prepare them for the exercise and ensure adherence during the project.
- Assessment and design of waste stream activities.
- Ensure consistent monitoring programs across the facilities, a training for trainers program is in place to ensure that the chief implementers (head chef or equivalent) are on the same page with regards to the project.

The local Project Coordinator will also be assisted by a Technical Officer in charge of social and environmental standards who will be responsible for ensuring that activities meet UNDP SES requirements, and comply with the laws and regulations of Egypt.

Table 30: Management Plan for Workstream activities

Potential Impact/Risk	Description	Positive /Negative	Proposed Mitigation	Institutional Responsibility for Implementation	Responsibility for Supervision	Means of Supervision
Training of the hotel's staff and Source Separation (increase separate collection)	Training of the hotel staff will have the following positive impacts: • Improve the operational collection of waste from hotels which will reduce the accumulated waste. • People separating the waste at the hotels (positive OHS impact as a result of training) • Better segregation of waste at source, therefore higher recovery of recyclables. • Availability of higher quality of compost that will support circular economy and allow its reuse in green areas • Increased Recycling Rate and higher revenue streams: Achieve and raise recycling targets by accurately segregating waste. Waste segregation practices prevents items suitable for recycling (such as metals, cardboard and plastics) from being thrown away with general waste. • Reduced Landfill Impact: Segregating waste allows higher diversion from landfills. This, in turn, reduces the landfill space requirements and GHG emissions.	Positive	NA	PMU (Local project coordinator supervised by PM)	UNDP	New training curriculum Training schedule Delivery of training Training records
Risk of improper design of pilot segregation of the 20 hotels activity	Improper design of the pilot segregation of the 20 hotels activitycould lead to misleading results on the available amounts for use. This could in turn impact the capacity of the anaerobic digestor vessels and the MBT design capacity upgrade requirements	Negative	• Design training programs such that both theoretical training and on the job training are included. This will help raise the staff appreciation of the process, educate them of the cruciality of the process, prepare them for the exercise and ensure adherence during the pilot project. • Choice of facilities need to take the following into consideration: - space availability for composting/biogas vessel - current level of segregation - scale of the hotel waste generation	PMU (Local project coordinator supervised by PM)	UNDP	New training curriculum Training schedule

Potential Impact/Risk	Description	Positive /Negative	Proposed Mitigation	Institutional Responsibility for Implementation	Responsibility for Supervision	Means of Supervision
			- Organizational HSE/waste management operational policies and procedures of the establishment - Opinions of operators on the quality of delivered segregation by the establishment • To ensure consistent monitoring programs across the facilities, a training for trainers program needs to be put in place to ensure that the chief implementers (head chef or equivalent) are on the same page with regards to the project.			
Risk of business as usual	• Risk of improper segregation at the source (Hotels) • Risk of mixing of segregated waste during collection & transport	Negative	The project has been designed to eliminate such risks by : • Complementing the pilot by training programs. • Design of the program with several levels of embedded controls and accountabilities, namely, a chief officer within each hotel who will be responsible for the segregation process followed by the waste operator's contractual agreement who is responsible for the safe collection, transport and safe treatment of the waste.	PMU (Local project coordinator supervised by PM)	UNDP	Delivery of training Training records Monitoring reports
Impacts from composting introduced within the new workstream	Releases to the air can include direct stack emissions and fugitive emissions associated with biological processes, as well as emissions from burning of biogas. Direct air emissions can include bioaerosols, particulate matter/dust, ammonia, amines, volatile organic compounds (VOCs), sulfides, odors, etc.	Negative	To avoid releases to the air, it is necessary that the vessel is a closed system with an appropriate exhaust air collection device.	PMU (Local project coordinator supervised by PM)	UNDP	Emissions monitoring reports
Impacts from composting introduced within the new workstream	Leachate and Runoff from storage of waste Improper storage of waste until processed may result in leachate and runoff containing organic material (biochemical oxygen demand (BOD), phenols, nitrates, phosphorous, dissolved metals and other contaminants.	Negative	To avoid harmful leachate and runoff from waste storage, the following needs to be carried out: • The material processing or storage areas of the facility should have a leachate barrier system that forms a secure barrier between the groundwater, soil, and substrata and the composting or stored organics, as well as systems for collecting and treating leachate; • For anaerobic digestion, maximize recycling of wastewater to the reactor; • Measure total organic carbon (TOC), chemical oxygen demand (COD), nitrogen (N), phosphorus (P) and chlorine (Cl) levels in the inlet and outlet flows from an anaerobic digester.	PMU (Local project coordinator supervised by PM)	UNDP	Design of leachate management system

Potential Impact/Risk	Description	Positive /Negative	Proposed Mitigation	Institutional Responsibility for Implementation	Responsibility for Supervision	Means of Supervision
			• Operate an anaerobic digester under thermophilic digestion conditions, in order to increase the pathogen destruction, biogas production rate (hence higher energy recovery) and the retention time · Maintain ideal composting conditions such as Carbon: nitrogen (C:N) ratio, Moisture content, Balance between particle size and void space to promote rapid decomposition, Optimum temperature levels to ensure complete pathogen destruction			
Impacts from composting introduced within the new workstream	Visual impacts of decentralized composting The treatment activities can be a nuisance to the guests and produce negative visual impacts in the resort areas if not appropriately located.	Negative	Visual impacts can be minimized by strategic selection of location within the hotel. The option of decentralized composting is generally ideal in hotels with waste water treatment operations. need to be minimized with appropriate vegetation and landscaping features.	PMU (Local project coordinator supervised by PM)	UNDP	Approval of competent authority in the governorate
Impacts from composting introduced within the new workstream	Risks of Fire Under certain conditions, biogas in combination with air can form an explosive gas mixture. The risk of fire and explosion is particularly high close to digesters. It can occur because of a gas leak, creation of an explosive zone, welding, clogged or frozen pipes or others.	Negative	To eliminate the risks of fire, the following needs to be carried out: • Collect biogas for use or treatment (e.g. energy recovery or flaring); · • Provide a fire alarm system, including temperature sensors in the waste being treated;	PMU (Local project coordinator supervised by PM)	UNDP	Approval of competent authority in the governorate, including fire alarm system incident reports
Impacts from composting introduced within the new workstream (Negative Displacement Impacts on Affected households – Ethnic Groups (Bedouins)	• Risk of Economic Displacement of Bedouin Community as a result of composting Organic Waste (Livelihood) •	Negative	1. Assistance from the project to allow people who belong to ethnic groups (Bedouins) to continue benefiting from organic waste, i.e. allow them to continue obtaining organic waste from the hotels. This mitigation measure should be developed in such a way that it responds to the requests of the project affected people during consultations and ensure that they • do not suffer adverse impacts as a result of the project activities • Continue to receive organic waste in line with their cultural and social norms. However, the project developer will consider prior treatment and drying of waste to allow safe handling of the waste. 2. Provide them with healthcare knowledge as well as occupational safety while acquiring organic waste from different facilities (hotels and MBT)	PMU (Local project coordinator supervised by PM)	UNDP	Grievance Mechanism Monitoring reports Grievances

Potential Impact/Risk	Description	Positive /Negative	Proposed Mitigation	Institutional Responsibility for Implementation	Responsibility for Supervision	Means of Supervision
	Risk of Economic Displacement (Cart owners) as a result of regulating the recyclables quantity and segregation quality	Negative	According to the workstream, segregation will be carried out from the source. To mitigate any impacts on the cart owners, it is necessary that they are allowed to receive the same segregated waste either directly from the hotels or from the MBT plant.			
	Risk of Economic displacement as a result of introducing new companies in collection process on Bedouin livelihood	Negative	No mitigation required as no economic displacement will result from the project activities on current collectors.			
	Mitigation of Risk of Vulnerability for Affected households	Negative	Mitigation of vulnerability for affected households can be mitigated by avoiding economic displacement as mentioned in mitigation of risk of economic displacement above.			
	Tension risk as a result of impact on Bedouin livelihoods between the different communities and facilities.	Negative	Tension risks are secondary to Economic Displacement of Bedouin Community as a result of composting Organic Waste (Livelihood) and will only be applicable if the organic stream was entirely withheld from the Bedouins. Therefore, the same mitigation measures hold, namely: 4. Assistance from the project to allow people who belong to ethnic groups (Bedouins) to continue benefiting from organic waste, i.e. allow them to continue obtaining organic waste from the hotels and only carry out composting of excess that is not needed. This mitigation measure should be developed in such a way that it responds to the requests of the project affected people during consultations and ensure that they : • do not suffer adverse impacts as a result of the project activities • Continue to receive organic waste in line with their cultural and social norms. However, the project developer will consider prior treatment and drying of waste to allow safe handling of the waste as discussed in section 4.2.1.2. 5. Develop and implement a good communication and accessible grievance mechanism for community members to address any complaints. 6. Provide them with healthcare knowledge as well as occupational safety while acquiring organic waste from different facilities (hotels and MBT)			

Table 31: Monitoring Plan

Potential Impact	Monitoring Indicator	Monitoring Location	Monitoring Methods	Monitoring Frequency	Monitoring Responsibility
Pilot Phase Preparation					
Training of the hotel's staff and Source Separation (increase separate collection)	○ Availability of PPE for workers ○ Availability of training material ○ Number of workers trained and attendance records	○ Hotel Kitchens	○ HSE Reports ○ Observation	• Continuous observation • Weekly reports	Hotel Staff Responsible
Risk of improper design of pilot segregation of the 20 hotels activity	○ space availability for composting/biogas vessel ○ current level of segregation ○ scale of the hotel waste generation ○ Organizational HSE/waste management operational policies and procedures of the establishment ○ Opinions of operators on the quality of delivered segregation by the establishment	○ Project documents	○ Reports about Stakeholder engagement activities ○ Field visits to construction site	• Single time review of report	Hotel Staff Responsible
Pilot Phase Implementation					
10.1.3.1 **Risk of business as usual** ○ Risk of improper segregation at the source (Hotels) ○ Risk of mixing of segregated waste during collection & transport	○ Quality of segregated waste at hotels ○ Separate segregated bags by fraction	○ Hotel kitchens ○ Collection points ○ MBT facility	○ HSE Reports ○ Visual observations	Monthly	• PMU to monitor quality of segregated waste at hotels • Zahret South Sinai Company
Impacts during Operational Phase					
Releases to the air can include direct stack emissions and fugitive emissions	Particulate matter/dust, ammonia, amines, volatile organic compounds (VOCs), sulfides, odors, etc.	○ Composting Areas	○ Visual inspection ○ measurements of air quality including PM 10 and ○ Frequent Inspection and recording of the Implementation of protective gear	Quarterly	Hotel operators
Leachate and Runoff from storage of waste	○ Clearance of design report ○ Leachate	Composting Areas	○ Visual inspection ○ Guest complaints	Weekly	Hotel operators
Visual impacts of decentralized composting	Vegetation and location within facility	○ Composting Areas	○ Visual inspection ○ HSE reports ○ Guest Complaints	Weekly	Hotel operators

Potential Impact	Monitoring Indicator	Monitoring Location	Monitoring Methods	Monitoring Frequency	Monitoring Responsibility
Risks of Fire	○ Fire Alarm system ○ Smell	○ Composting Areas	○ Visual inspection ○ HSE reports ○ Guest Complaints ○ Fire alarm installation clearance from ministry of defense and regular maintenance reports	Monthly	Hotel operators
Negative Displacement Impacts on Affected households	Grievances numbers	○	Grievances	Weekly	PMU