Enhancing Climate Change Adaptation through Soft Coastal Protection in five vulnerable hotspots in the Nile Delta and through integrated coastal zone management for Egypt’s North Coast

Environmental and Social Management Framework

26 December 2018

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# Executive Summary

This Environmental and Social Management Framework (EMSF) is prepared in support of a project proposal entitled “Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt”. The project is submitted by the Ministry of Water Resources and Irrigation (MWRI) to the Green Climate Fund (GCF). This project is supported by the United Nations Development Programme (UNDP) in its role as a GCF Accredited Entity. The project has been screened against the UNDP’s Social and Environmental Standards Procedure and deemed a Moderate Risk (World Bank/International Finance Corporation Category B) project. As such, an ESMF has been prepared for the project.

The Shore Protection Authority (SPA), The Ministry for Water Resources and Irrigation, is the National Designated Authority and executing agency. A Project Management Unit (PMU) will be established for the implementation of the project and to manage compliance with this ESMF.

The project will target farmers and fisher-folk people directly and people in urban/rural communities indirectly along the Mediterranean coastline of Egypt. It involves two complementary outputs: Installation of coastal protection structures at five (5) sea level rise vulnerability hotspots spanning 69 km in the Nile Delta; and, Development of an ICZM plan for the entire North Coast of Egypt. The five vulnerable hotspots lie within the Nile Delta, and were identified during an engineering scoping assessment. These coastal protection measures are in the Port Said, Damietta, Beheira, Dakahlia, and Kafr El-Sheikh governorates. A second component of the project involves the development of an integrated coastal zone management (ICZM) plan for the entire North Coast to manage long-term climate change risks and provide Egypt with adaptability to impending flood risks.

The ICZM plan will provide the necessary management framework to support/allow the development of effective climate change adaptation measures in the long term and will cover all stages of the ICZM planning cycle.

The proposals have been designed to mirror natural coastal features and/or sand dunes and will transform the areas from high risk zones to low risk zones for coastal flooding. Some of the areas will be stabilized with a combination of rocks and local vegetation species to encourage dune growth by trapping and stabilizing blown sand to manage long-term climate change risks and provide Egypt with adaptability to impending flood risks.

The project is aligned with Egypt’s priorities as outlined in its Nationally Determined Contribution to the Paris Agreement and in line with Egypt’s Country Work Programme as submitted to the Green Climate Fund. The project is also a part of UNDP’s Work Programme to the Green Climate Fund and is aligned with Government priorities for UNDP, on as per the Country Programme Document which outlines UNDP’s foci in Egypt.

The project was screened against UNDP’s Social and Environmental Standards Procedure. The Social and Environmental Screening Template was prepared and the project deemed to be a moderate risk (Category B) project. An impact risk assessment was undertaken using the UNDP Social and Environmental Screening Procedure to assess the probability and the impact of the risk. Most significant impacts determined were related to social aspects regarding accessibility to the beach and sea, and were considered moderate impacts. Potentiality of soil and groundwater contamination was another point considered as moderate significance. Mitigation measures were proposed for all identified potential impacts to include; stakeholder engagement; provision of temporary access points; and, handling/acceptance of materials from different locations, particularly dredged material to be used as a fill; minimizing turbidity while site dewatering.

None of the interventions will require the displacement of people or will be conducted in protected areas or sensitive locations. A two tier Grievance Redress Mechanism structure was developed to address all complaints and/or grievances in the project. The first trier redress mechanism involves the receipt of a complaint and/or grievance at the village/town and/or Markaz level. The resolution at the first tier will normally be completed within 15 working days and the complaint and/or grievance will be notified of the proposed response through a disclosure form. Should the grievance be not resolved within this period to the satisfaction of the complainant, the grievance will be referred to the next level of Grievance Redress Mechanism.

The final section of this framework presents a preliminary approximate budget for implementation of the ESMF, with an estimated figure of $500,000.

# Introduction

1. This Environmental and Social Management Framework (ESMF) has been prepared in support of a project proposal for “Enhancing Climate Change Adaptation through soft coastal protection in five vulnerable hotspots in the Nile Delta and through integrated coastal zone management for Egypt’s North Coast” by the Government of Egypt to the Green Climate Fund (GCF). As this project is supported by UNDP in its role as a GCF accredited Entity. The project has been screened against UNDP’s Social and Environmental Standards Procedure and deemed a Moderate Risk (World Bank/International Finance Corporation Category B) project. As such, an Environmental and Social Management Framework has been prepared for the project.

## Background

1. One of the most vulnerable deltas in the world to climate change is the Nile Delta in Egypt. In its Fourth Assessment Report, the IPCC[[1]](#footnote-1) identified the Nile Delta as one the world’s three “extreme” vulnerability hotspots under climate change conditions (IPCC, 2007). This region accounts for more than 50% of the country’s economic activity through agriculture, industry and fisheries. Most of Egypt’s agricultural activities take place within its low-lying Nile Delta, contribute about 20% of the country’s GDP and account for the largest source of employment, around 30% of the labor force. As Egypt does not produce enough food to feed its current population, any loss of prime agricultural land in due to coastal flooding from sea level rise will have a direct adverse impact on the livelihoods of millions of people and lead to hardship throughout the entire economy. Coastal areas in the Nile Delta are especially vulnerable to climate variability and changes in sea level. Extreme sea level events, driven by the combination of high tides and storm surges, have led to devastating coastal flooding and millions of dollars in damages. This is evident by the loss of life during coastal floods in Alexandria in 2015 as well as flood waters reaching and damaging portions of the international road located hundreds of meters inland. The rate of sea level for the Nile Delta ranges between 3.2 - 6.6 mm per year and is due to two major factors - globally rising sea due to thermal ocean expansion and deglaciation and locally sinking land due to compaction of sediments and loss of annual replenishment of sediments. The IPCC concludes that global mean sea levels have risen between 2.8 and 3.6 mm per year over the period 1993 to 2010. During that same period, local land subsidence has been evident across the entire Delta, with actual rates ranging from about 0.4 mm/year in Alexandria to the west to around 3.0 mm/year in Port Said to the east.[[2]](#footnote-2)
2. Moreover, coastal areas in the Nile Delta will be vulnerable to an increasing frequency and intensity of extreme coastal storms. As with many climate change modeling outcome, projected regional changes in storm frequency are still uncertain and there is no consensus reported by the IPCC in this respect; regional projections at the spatial scale of the Nile Delta are even more difficult as they need to account for both storm intensity and changes in storm tracks.[[3]](#footnote-3) Nevertheless, the southern Mediterranean has already seen a measurable increase in the number of natural disasters: from an average of three natural disasters per year in 1980, the region experienced a steady increase to an average of more than 15 per year in 2006.[[4]](#footnote-4) An increase in frequency and severity of storm surges is already evident over the past seven years with three extreme storms most commonly associated with 1-in-50 year storm events. The continuation of rising seas, sinking lands, and more frequent and intense storms is a necessary inference from the review of recent trends and future climate change forecasts.
3. The Government of Egypt through the Shore Protection Authority (SPA) with support from UNDP, is formulating a project on adaptation to climate change impacts “Enhancing Climate Change Adaptation through soft coastal protection in five vulnerable hotspots in the Nile Delta and through integrated coastal zone management for Egypt’s North Coast” for submission to the GCF. The project aims to protect five vulnerable hotspots from erosion, and improve the resilience of vulnerable communities to climate change impacts. It also aims to develop an integrated coastal zone management (ICZM) plan for the entire North Coast to manage long-term climate change risks and provide Egypt with adaptability to impending flood risks.
4. To date, protecting coastal areas in Egypt has typically meant structures such as seawalls, groins, rip-rap, and levees. Due to the increased understanding of natural shoreline function improves, there is today a growing acceptance that “hard” shoreline protections are expensive, can cause unexpected erosion to beaches and dunes, require costly ongoing maintenance, adversely affect adjacent areas/properties, and disrupt natural water flows. While "hard" structures continue to be used for shoreline defence, "soft" stabilization methods such the ones proposed are becoming more prevalent in coastal areas, either as the sole method of protection or in conjunction with "hard" stabilization practices. Accordingly, a pilot project was carried out by SPA in 2016 along a stretch of approximately 250m along Egypt’s northern Mediterranean coastline using low cost technologies to protect the coastal zone from flooding caused by extreme storms. These included artificial sand dunes built by means of sand traps made of natural bamboo fences fixed to the ground, or based on a clay or geotextile core. The purpose of this pilot project was to study the impact of the traps on coastal flooding following an extreme weather event. It yielded promising results on the short term.
5. Based on the pilot project results, the Government of Egypt decided to extend the pilot to five (5) locations identified as hotspots. The extension involves the installation of 69 km of sand dune dikes along the five (5) vulnerable hotspots within the Nile Delta. These “soft” coastal protection measures are in the Port Said, Damietta, Beheira[[5]](#footnote-5), Dakahlia, and Kafr El-Sheikh governorates. The activities are designed to mirror natural coastal features and/or sand dunes and will assist in providing resilience to the areas from high risks zones for coastal flooding to low risk zones for coastal flooding. The five vulnerable hotspots will be stabilized with a combination of rocks and local vegetation species to encourage dune growth by trapping and stabilizing blown sand.

## Overview of the Project

1. The project aims to enhance the resilience of the Northern coast and Nile Delta in Egypt due to the combination of sea level rise and more frequent extreme storm events through scaling up the use of soft engineering solutions and ecosystem-based adaptation measures.
2. The project focuses on the installation of 69 km of sand dune dikes along five (5) vulnerable hotspots within the Nile Delta that were identified during a scoping assessment. These “soft” coastal protection measures are in the Port Said, Damietta, Beheira, Dakahlia, and Kafr El-Sheikh governorates. Figure 1 presents the five vulnerable hotspots on the map.
3. The project has been designed to mirror natural coastal features and/or sand dunes and will transform the areas from high risk zones to low risk zones for coastal flooding. The five vulnerable hotspots will be stabilized with a combination of rocks and local vegetation species to encourage dune growth by trapping and stabilizing blown sand (i.e., ecosystem-based measures.
4. The project includes the development of an ICZM plan for the entire North Coast to manage long-term climate change risks and provide Egypt with adaptability to impending flood risks. The ICZM plan will provide the necessary management framework to support/allow the development of effective climate change adaptation measures in the long term and will cover all stages of the ICZM planning cycle, namely high resolution diagnosis, new regulatory and institutional structures, stakeholder engagement, capacity building, and the implementation of a national observation system.

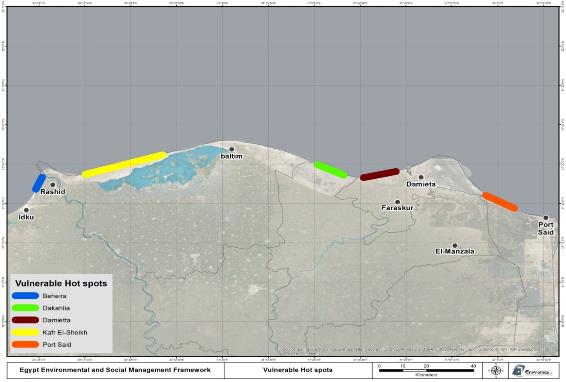


Figure 1: The Five Vulnerable Hotspots on a Map

### Summary of Activities

1. The proposed project is structured across two complementary outputs:
2. **Output 1:** Installation of soft coastal protection structures at five (5) sea level rise vulnerability hotspots spanning 69 km in the Nile Delta.
3. The proposed GCF project will enable reducing vulnerabilities of assets and populations through promoting and scaling up a set of “soft engineering solutions” and ecosystem-based coastal protection measures that can sustain proper ecosystem functioning and productivity in each of the coastal lagoons such as the conservation of existing wetlands and enhancement of their functionality. A UNDP-GEF- SCCF Climate Change Adaptation in the Nile Delta Project has tested the design and feasibility of several soft engineering solutions for coastal protection (namely beach nourishment and using of geotubes and low cost soft dikes to alleviate impacts of extreme weather events on infrastructure and human settlements) per the geomorphologic, climatic, and development characteristics of the Nile Delta area.
4. *Port Said:* Located west near new Ashtom Elgamil Boughaz. Characterized by low-lying, highly subsiding land (Natural ground level is 0.8 to 2m above mean sea level). The area is exposed to sea level rise without protection. The range in land subsidence rate is estimated to be between 3 to 5 mm/year while the rate of sea level rise is estimated to be around 2mm/year. Total protected area is 12 km.
5. *Damietta:* Located east of the new Damietta city. Characterized by low-lying, moderately subsiding land (Natural ground level is 1.2 to 1.8m above mean sea level). The area is exposed to sea level rise with only limited protection. The range in land subsidence rate is estimated to be between 1 to 2mm/year while the rate of sea level rise is estimated to be around 2.3 mm/year. Total protected area is 12 km.
6. *Beheira:* Located near West Rosetta estuary. Characterized by low-lying, highly subsiding land (Natural ground level is 0.3 to 1.3m above mean sea level). The area is experiencing severe erosion due to groin construction. The range of in land subsidence rate is estimated to be between 3.0 to 4.0 mm/year while the rate of sea level rise is estimated to be around 1.6 mm/year. Total protected area is 6 km.
7. *Dakahlia:* Located west of new Gamasa city. Characterized by low-lying, moderately subsiding land (Natural ground level is 0.5 to 1m above mean sea level). The area is exposed to sea level rise without protection. The range in land subsidence rate is estimated to be between 0.5 to 1 mm/year while the rate of sea level rise is estimated to be around 1 mm/year. Total protected area is 12 km.
8. *Kafr El-Sheikh:* Located near the West Burullus inlet. Characterized by low-lying, weakly subsiding land (Natural ground level is 0.25 to 1.2m above mean sea level). The area is exposed to sea level rise without protection. The range in land subsidence rate is estimated to be between 0.0 to 1 mm/year while the rate of sea level rise is estimated at 1 mm/year. Total protected area is 27 km.
9. There are four (4) types of coastal protection designs, or models (i.e., Model 1, Model 2, Model 3, and Model 4). Model 3 is the only design utilizing stone face coverings. The model designs are primarily differentiated relative to the elevation of the low-lying areas they are designed to protect. Nevertheless, the choice of which model to construct at a given hotspot site depends on several other factors, including sea level rise projections, anticipated height of storm surge above mean high tide during extreme events, site geomorphological characteristics, nearby bathymetry, etc.
10. The cross sections of Model 1 designs are presented in Figure 2. This design will be constructed in areas where the adjacent land elevations are up to 1.5 meters above mean sea level. Within the Model 1 design, there are three different sub-designs, A, B, and C. Each of the designs will use sand from site excavation activities as fill material. There are no large stone face coverings included in any of the Model 1 sub-designs. The sub-designs are distinguished by the quantities of dredging material coming from Lake Burullus. Sub-design A requires the least amount of dredged material and sub-design B requires the largest amount of such material. All three sub-designs require the use of geotextiles as a barrier between sand fill and the substratum.

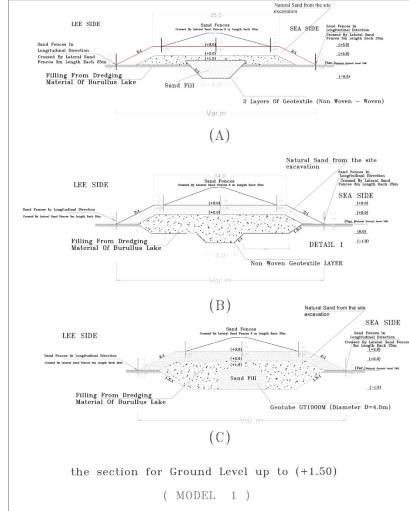


Figure 2: Cross Sections of Model 1 Designs

1. The cross sections associated with the design of Models 2, 3, and 4 are shown in Figure 3.
2. Model 2:

* The design consists entirely of dredged materials from the nearest lake.
* It will be constructed in areas where the adjacent land elevation is higher than 1.5 meters above mean sea level.
* It will be restricted to areas in the front of beach cities and villages.
* Roughly 10 km will be constructed using this design.
* There will be no excavation or de-watering activities involved in the works.
* This model is suitable for recreational areas to minimize beach accessibility issues.

1. Model 3:

* The design will be constructed in areas where the adjacent land elevations are less than 1.0 meters above mean sea level.
* The design will use sand from site excavation activities as fill material as well as large dolomite stone (i.e., up to 100 kg stones) covering the slope on the seaside of the structure.
* Roughly 6 km will be constructed this design.
* This design is specific to Burullus. The shoreline is North-South oriented at this location and accordingly, dunes are not expected to naturally form like the rest of the locations. Accordingly, a more solid structure was proposed for this location.

1. Model 4:

* The design will be constructed in areas where the adjacent land elevations are higher than 1.5 meters above mean sea level.
* The design involves the construction of interlocking wooden fence that will serve to capture shifting sand in the coastal areas.
* With time, roughly 1-2 years, enough sand will be accumulated within the interlocking fence that it will resemble natural sand dune. At that point, the structure will be stabilized with local vegetative species to thwart future shifting of the sand.
* Roughly 20 km will be constructed using this design.

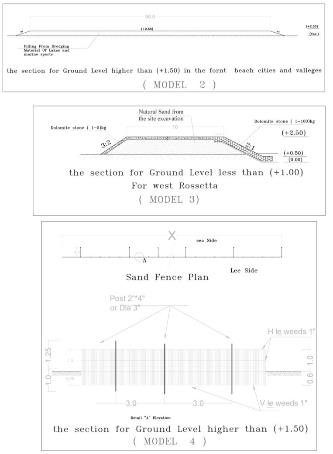


Figure 3: Cross Sections of Model 2, 3 & 4 Designs

1. There are three major activities associated with the construction of the soft coastal protection as well as numerous sub-activities, as outlined below.
2. Activity 1/1: Site preparation activities for the five locations along 69km (in total) of coastline along Nile Delta. It will involve the following major sub activities:

* Finalize engineering design specifications for each of the five locations.
* Obtain all administrative permissions to enable access to each of the locations.
* Undertake all needed clearing, grubbing, stripping, dewatering and any other activities associated with site preparation at the five locations.

1. Activity 1/2: Constructing location-specific coastal soft protection structures at the 5 vulnerable: hotspot locations. It will involve the following major sub activities:

* Initiate a tendering process to select local contractor(s) to construct the coastal protection measures, including quality control requirements.
* Construct the 5 coastal protection measures, including all excavation, fill placement/compaction, rip-rap placement, geotextile placement, and final grading.
* Conduct and maintain records for site inspection during the construction period, including environmental safeguard monitoring.

1. Activity 1/3: Developing and implementing an operations & maintenance programme for the installed soft protection structures. It will involve the following major sub activities:

* Develop a soft coastal protection maintenance manual to govern future maintenance and rehabilitation activities, tailored to Nile Delta conditions.
* Codify the procedures in the manual within the governing regulations of the SPA.
* Conduct operations and maintenance activities over the lifetime of the project consistent with the coastal protection maintenance manual.

1. The following Table 1 presents the five hotspot locations and provides the start and end point of each soft protection structure. The table also presents the expected protection designs for the different locations.

Table 1: Proposed hotspot areas and protection type for the GCF proposal, main information identified at the Nile Delta

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Governorate Ranked according to priorities** | **Location** | **Coordinates** | | | | **Vulnerability criteria** | **Land subsidence (mm/y)** | **Natural ground level / m** | **\* SLR rate (mm/y)** | **Land use of hinter land** | **Proposed dike initial design model(s)** | **Length of protection / km** |
| **From E. N.** | | **To E. N.** | |
| **Area 1 : Kafr Elshikh** | **West Burullus inlet** | **30°49'14.91"** | **31°32'22.86"** | **30°31'34.76"** | **31°27'24.55"** | **Low-lying, weakly subsiding, exposed without protection** | **0.0-1.0** | **0.25 : 1.20** | **1 Estimated from Al-Burullus** | **Beaches, narrow Burullus lake low-lying barrier, International Road, there are 2 proposals: fish farms & urban development** | **1a, 1b and 4** | **27** |
| **Area 2 : Port Said** | **West new Ashtom Elgamil Boughaz** | **32°9'45.24"** | **31°18'44.30"** | **32°3'13.30"** | **31°22'5.83"** | **Low-lying, highly subsiding, exposed without protection** | **3.0-5.0** | **0.80 : 2.00** | **2.3** | **Resort beaches, narrow Manzala lake low-lying barrier, International Road & petroleum industries** | **1b and 2** | **12** |
| **Area 3 : Behira** | **West Rosetta estuary, downcoast of the 9 groins** | **30°21'40.43"** | **31°26'38.85"** | **30°20'15.77"** | **31°23'37.08"** | **Low-lying, highly subsiding, experiencing down drift local erosion due to groin construction** | **3.0-4.0** | **0.30 : 1.30** | **1.6 Estimated from Alexandria** | **Beaches and cultivated fields.** | **3** | **6** |
| **Area 4 : Damietta** | **East of new Damietta city** | **31°42'39.68"** | **31°28'7.74"** | **31°35'14.32"** | **31°26'33.56"** | **Low-lying, moderately subsiding, exposed with limited protection** | **1.0-2.0** | **1.20 : 1.80** | **2.3 Estimated from Port Said** | **Resort beaches and cultivated area** | **1a and 2** | **12** |
| **Area 5 : Dakahlia** | **West of new Gamasa city** | **31°30'42.40"** | **31°27'14.16"** | **31°24'45.46"** | **31°29'52.56"** | **Low-lying, moderately subsiding, exposed without protection** | **0.5-1.0** | **1.00 : 2.00** | **1 Estimated from Al-Burullus** | **Resort beaches and cultivated fields & International Road** | **2 and 4** | **12** |

1. **Output 2:** Development of an ICZM plan for the entire North Coast of Egypt.
2. The Government of Egypt has completed initiation steps on the development of an ICZM Strategy with the preparation of local ICZM Plans in Marsa Matruh and Alexandria and the development of the ICZM Scoping Study.
3. The “ICZM plan” stage will be carried out through the preparation of a comprehensive ICZM Plan that (i) defines the necessary engineering and management measures for climate change adaptation; (ii) establishes the necessary management framework to ensure the effective and sustainable implementation of that measures; and (iii) sets up the procurement and installation of a national observation system to track unfolding climatic changes in coastal zones. The last two stages of the ICZM, “Implementation” and “Monitoring and Evaluation” are beyond the scope of the proposed project and will be taken up by the SPA upon conclusion of the project.
4. Upon full completion of the diagnosis stage, the planning stage will focus on the preparation of the ICZM plan itself. The plan will define strategic and operational objectives to be achieved through a set of actions; and its implementation strategy (roadmaps, budget, and monitoring system).
5. There are four major activities associated with the development of the ICZM plan for the North Coast as well as numerous sub-activities, as outlined below.
6. Activity 2/1 focuses on hazard, vulnerability and risk high resolution assessments of erosion and flooding under climate change scenarios. It will involve the following major sub-activities:

* Characterization of marine dynamics based on the numerical modelling of wind, waves, currents and sea level change in the future
* Establishment of coastal modelling systems consisting of databases, methods and tools suitable for modelling shoreline dynamics in the North Coast contect.
* Conducting high-resolution hazard assessment under a set of climate change scenarios to develop flooding maps that account for storm surge inundation levels that factor in the projected sea level rise.
* Conducting of vulnerability and risk high resolution assessment under climate change scenarios to integrate the exposure of coastal areas and their sensitivity to flooding and erosion impacts.

1. Activity 2/2 focuses on the development of the ICZM plan to include a shoreline master plan and a regulatory/legislative framework. It will involve the following major sub-activities:

* Development of a Shoreline Master Plan for climate change adaptation to define the most promising shoreline management measures for climate change adaptation, and their implementation strategy.
* Development of a regulatory and legislative framework to ensure the effective implementation of climate change adaptation activities under ICZM principles.
* Development of a stakeholder participation strategy to ensure a shared ownership of the ICZM Plan with concerned authorities and civil society groups in the planning process
* Establishment of the monitoring and evaluation system to enable managers to take appropriate corrective actions to achieve the expected results of the plan by evaluating the progress of the plan implementation.

1. Activity 2/3 focuses on the development of a capacity building program for institutions involved in the management of the north coast. It will involve the following major sub-activities:

* Assessment of capacity needs for ICZM planning to catalogue on-going coastal management capacity building activities, and to identify gaps in skills, knowledge and attitudes for the practice of ICZM and climate change adaptation
* Transfer of coastal observation and modelling systems to coastal management to ensure that staffs from selected institutions have the necessary scientific knowledge to assimilate and integrate both the coastal observation and modelling systems
* Design and implementation of modular training program for MWRI/SPA and EEAA to build skills for professional development of coastal management practitioners, in a diversity of capacities (e.g. policy positions or day-to-day management)
* Design and implementation of the modular training program for other stakeholders to be able to collaborate and actively participate in the implementation of the ICZM Plan.
* Monitoring and evaluation of the capacity building program´s results.

1. Activity 2/4 focuses on the implementation of specific components of a national observation system.

## Environmental and Social Risk Assessment

1. As this project is supported by UNDP in its role as a GCF Accredited Entity, the project has been screened against UNDP’s Social and Environmental Standards Procedure. The Social and Environmental Screening Template was prepared and the project deemed to be a moderate risk (Category B) project. Discussions on the impact assessment are provided in the Social and Environmental Screening Template, which provided the rationale for the project being classified as a moderate risk. This ESMF provides further discussion below.
2. An impact risk assessment was undertaken using the UNDP Social and Environmental Screening Procedure to assess the probability (expected, highly likely, moderately likely, not likely) and the impact of the risk (critical, severe, moderate, minor, negligible). From this, a significance value was attributed to the potential impact (negligible, low, medium, high and extreme).

Table 2: Rating of Probability of Risk

|  |  |
| --- | --- |
| Score | Rating |
| 5 | Expected |
| 4 | Highly Likely |
| 3 | Moderately likely |
| 2 | Not Likely |
| 1 | Slight |

Table 3: Rating of Impact of Risk

|  |  |  |
| --- | --- | --- |
| **Score** | **Rating** | **Definition** |
| 5 | Critical | Significant adverse impacts on human populations and/or environment. Adverse impacts high in magnitude and/or spatial extent (e.g. large geographic area, large number of people, transboundary impacts, cumulative impacts) and duration (e.g. long-term, permanent and/or irreversible); areas impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories of indigenous peoples; involve significant displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict |
| 4 | Severe | Adverse impacts on people and/or environment of medium to large magnitude, spatial extent and duration more limited than critical (e.g. predictable, mostly temporary, reversible). The potential risk impacts of projects that may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially severe. |
| 3 | Moderate | Impacts of low magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures |
| 2 | Minor | Very limited impacts in terms of magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated |
| 1 | Negligible | Negligible or no adverse impacts on communities, individuals, and/or environment |

Table 4*:* UNDP Risk matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Impact** | 5 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 1 |  |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 |
| **Probability** | | | | | |
| **Green = Low, Yellow = Moderate, Red = High** | | | | | | |

1. When undertaking the risk assessment, all activities were assessed, including, hard/soft infrastructure and livelihood interventions. Specific measures for each matter eg water; erosion, noise etc., are discussed along mitigation measures later in this ESMF.

| **Output** | **Activity** | **Sub Activity** | **Unmitigated Impacts** | **Probability of Impact and Impact** | **Avoidance and Mitigation Measures** | **Probability of Impact and Impact post mitigation** |
| --- | --- | --- | --- | --- | --- | --- |
| Output 1 | Site Preparation | Engineering Design | * + Insignificant Impacts (Office Work) | * + Probability: 1   + Impact: 1   + Risk Level: Low | * + The specific design activity does not require mitigation measures. However, mitigation measures to be incorporated in design include:   + Selection of models that minimize need for road transport.   + Selection of environmentally friendly material including geotextile.   + Minimize need for acquiring fill material from offsite locations.   + Design of dewatering activities to minimize impact on the marine. | * + Probability: 1   + Impact: 1   + Risk Level: Low |
| Permits | * + Non-compliance with local regulations.   + Legal considerations including closure, fines and imprisonment | * + Probability: 2   + Impact: 3   + Risk Level: Moderate | * + Definition of required permits.   + Consultation with relevant stakeholders for identification of necessary project permits.   + Plan for acquiring relevant permits prior to commencing any construction activities. | * + Probability: 1   + Impact: 3   + Risk Level: Low |
| Site Clearing / Stripping | * + Biological impact: removal of sensitive or critical habitats. | * + Probability: 2   + Impact: 3   + Risk Level: Moderate | * + The locations will be surveyed for critical habitat to be avoided during the works, though none of the locations is declared “protected area”.   + Planning to re-plant removed vegetation in original location. | * + Probability: 1   + Impact: 3   + Risk Level: Low |
| * + Soil and Groundwater contamination: Production of solid waste that requires temporary storage, transport and disposal | * + Probability: 2   + Impact: 2   + Risk Level: Low | * + The project will develop and implement a waste management plan that covers waste collection, storage and disposal. | * + Probability: 1   + Impact: 1   + Risk Level: Low |
| * + Social Impact: potential removal of structures that may be legally or illegally owned by residents of the area, which may result in social unrest and potential vandalism. | * + Probability: 2   + Impact: 4   + Risk Level: Moderate | * + Engagement and compensation of potentially impacted persons. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| Site Clearing / Grubbing | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement and excavation activities. | * + Probability: 5   + Impact: 3   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities and temporary storage of excavated sands in nearby locations.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads. | * + Probability: 5   + Impact: 1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks form fuel storage | * + Probability: 3   + Impact: 3   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| * + Social impact: Prevention of shoreline accessibility for fishermen and beach recreational activities during the construction period, which may lead to social unrest and potential vandalism. | * + Probability: 4   + Impact: 3   + Risk Level: Moderate | * + Avoid construction activities during summer time in areas known for beach accessibility for recreational activities, as possible.   + Coordinate project implementation schedule with communities.   + Provide temporary access points for fishermen during construction. | * + Probability: 3   + Impact: 2   + Risk Level: Moderate |
| Construction | Tendering | * + Selection of incompetent contractor, which may result in; potential contamination of air quality soil, marine and groundwater; socio-economic impacts; and, improper implementation of project design. | * + Probability: 2   + Impact: 4   + Risk Level: Moderate | * + Tender documents to include a “pre-qualification” process to ensure bidding of only competent contractors. Tender document to include an HSE exhibit to be included in contract, at a later stage, to clearly define tenderers HSE obligations. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| Construction Process /Acquiring soil from Burullus/other lakes | * + Social impact: depriving farmers from using the dredge material for enhancing their field productivity | * + Probability: 5   + Impact: 3   + Risk Level: Moderate | * + Minimize use of dredged material and maximize sand use for construction of the dykes.   + Engage with local communities and define suitable compensation. | * + Probability: 5   + Impact: 1   + Risk Level: Low |
| * + Impact on existing roads for dredged material transport | * + Probability: 5   + Impact: 2   + Risk Level: Moderate | * + In case transportation will require a large number of journeys on existing roads; a traffic impact assessment will be conducted; and, trucks will follow a journey management plan to be prepared and implemented. | * + Probability: 5   + Impact: 1   + Risk Level: Low |
| Construction Process / Excavation Using Heavy Equipment | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement and excavation activities. | * + Probability: 5   + Impact: 3   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities and temporary storage of excavated sands in nearby locations.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads. | * + Probability: 5   + Impact: 1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks form fuel storage | * + Probability: 3   + Impact: 3   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| * + Social impact: Prevention of shoreline accessibility for fishermen and beach recreational activities during the construction period, which may lead to social unrest and potential vandalism. | * + Probability: 4   + Impact: 3   + Risk Level: Moderate | * + Avoid construction activities during summer time in areas known for beach accessibility for recreational activities, as possible.   + Coordinate project implementation schedule with communities.   + Provide temporary access points for fishermen during construction. | * + Probability: 3   + Impact: 2   + Risk Level: Moderate |
| Construction Process / Dewatering | * + Air Quality: Emissions from Dewatering Pumps utilizing Diesel. | * + Probability: 5   + Impact: 2   + Risk Level: Moderate | * + Inspection and approval of efficient pumps only. | * + Probability: 5   + Impact: 1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from pumps.   + Spills during refuelling activities.   + Spills during pump maintenance.   + Leaks form fuel storage. | * + Probability: 3   + Impact: 2   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for pump refuelling.   + Secondary containment of fuel storage tanks. | * + Probability: 2   + Impact: 1   + Risk Level: Low |
| * + Marine Impacts due to turbidity: Water Quality, Fauna and Flora (Sunlight penetration issues due to turbidity) | * + Probability: 4   + Impact: 3   + Risk Level: Moderate | * + Suction shall be from the surface to minimize re-suspension of sediments.   + Selection of discharge location to avoid marine-sensitive and/or shallow areas through carrying out limited marine surveys. | * + Probability: 3   + Impact: 1   + Risk Level: Low |
| Construction / Sand Filling | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement and filling activities. | * + Probability: 5   + Impact:3   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads. | * + Probability: 5   + Impact:1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks form fuel storage | * + Probability: 3   + Impact: 3   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| Construction / Dredged Material Filling (From Lakes) | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement and filling activities. | * + Probability: 5   + Impact:3   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads. | * + Probability: 5   + Impact:1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Utilization of contaminated material   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks form fuel storage.   + Introduction of Alien species. | * + Probability: 3   + Impact: 4   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks.   + Chemical analysis of dredged material for chemical contamination. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| Construction / Dolomite Filling | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement and filling activities. | * + Probability: 5   + Impact:3   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads. | * + Probability: 5   + Impact:1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks form fuel storage. | * + Probability: 3   + Impact: 3   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| Construction / Geotextile Laying | * + Soil and Groundwater contamination: due to degradation of geotextile material. | * + Probability: 2   + Impact: 1   + Risk Level: Low | * + Proper selection of geotextile material suitable for seawater; i.e. propylene geotextile is more tolerable to pH variations   + Avoid sheer forces on geotextile during design of the dykes. Compact the soil below and remove sharp stones. | * + Probability: 1   + Impact:1   + Risk Level: Low |
| Construction / Compaction and Grading | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement and filling activities.   + Noise and Vibration | * + Probability: 5   + Impact:3   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads.   + Avoid Compaction utilizing heavy equipment near existing structures such as constructed fences.   + Avoid Compaction during night hours. | * + Probability: 5   + Impact:1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Utilization of contaminated Water for compaction, which may introduce alien species.   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks form fuel storage. | * + Probability: 3   + Impact: 3   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks.   + Chemical and biological analysis of water used for compaction. Preferable to use seawater. | * + Probability:1   + Impact: 2   + Risk Level: Low |
| Construction / Fence Erection | * + Littering: manual installation of fences (wood and bamboo) will result in bamboo and wood cuttings (solid waste). | * + Probability: 3   + Impact: 2   + Risk Level: Moderate | * + Proper storage and housekeeping.   + Only natural materials will be utilized wood and bamboo).   + Solid Waste disposal to approved sites for recycling. | * + Probability: 1   + Impact:1   + Risk Level: Low |
| Construction / Site Rehabilitation | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement. | * + Probability: 5   + Impact: 2   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads. | * + Probability: 5   + Impact:1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks from fuel storage | * + Probability: 3   + Impact: 3   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks.   + Use excavated sands for filling. Excess sands to be used in levelling of nearby natural depressions. | * + Probability: 1   + Impact:2   + Risk Level: Low |
| Operation and Maintenance | Develop Maintenance manual | * + Insignificant Impacts (Office Work) | * + Probability: 1   + Impact:1   + Risk Level: Low | * + None Required. The maintenance manual should define an inspection schedule and potential maintenance requirements that ensure the integrity of the structures. | * + Probability: 1   + Impact: 1   + Risk Level: Low |
| Codify Manual Procedures | * + Insignificant Impacts (Office Work) | * + Probability: 1   + Impact: 1   + Risk Level: Low | * + None Required | * + Probability: 1   + Impact: 1   + Risk Level: Low |
| Operations and Maintenance Activities | * + Air Quality: Emissions from Heavy Equipment utilizing Diesel.   + Dust emissions from equipment movement. | * + Probability: 5   + Impact:3   + Risk Level: Moderate | * + Inspection and approval of efficient equipment only.   + Minimizing equipment movements through proper planning of activities.   + Application of dust suppression.   + Application of vehicle speed limit, particularly on unpaved roads. | * + Probability: 5   + Impact:1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from equipment.   + Spills during refuelling activities.   + Spills during equipment maintenance.   + Leaks from fuel storage. | * + Probability: 3   + Impact: 4   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for equipment refuelling.   + Secondary containment of fuel storage tanks. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| * + Biological: potential for introduction of alien species through utilized clay or water. | * + Probability: 4   + Impact:3   + Risk Level: Moderate | * + Periodic visual observation of alien species.   + Manual removal and disposal of alien species, as needed. | * + Probability: 4   + Impact: 1   + Risk Level: Low |
| Others | Power Generation – Standby Diesel generators. | * + Air Quality: Emissions from generators utilizing Diesel. | * + Probability: 5   + Impact: 2   + Risk Level: Moderate | * + Inspection and approval of efficient generators only. | * + Probability:5   + Impact: 1   + Risk Level: Low |
| * + Soil and Groundwater Contamination: potential leaks of oil and diesel fuel from generators.   + Spills during refuelling activities.   + Spills during generator maintenance.   + Leaks form fuel storage. | * + Probability: 3   + Impact: 2   + Risk Level: Moderate | * + Spill response procedure, kits and training on site.   + Awareness and training.   + Procedure for generator refuelling.   + Secondary containment of fuel storage tanks. | * + Probability: 2   + Impact: 1   + Risk Level: Low |
| Beach Accessibility Management | * + Social Impact: Blocking entrance to beach to beneficiaries (recreation and fishing), potentially leading to social unrest and vandalism. | * + Probability: 4   + Impact:3   + Risk Level: Moderate | * + Provision of sufficient access points and community involvement.   + Monitoring behaviour of responsible persons controlling access points to eliminate possibility of bullying.   + Grievance mechanism that allows any impacted party to express its concern.   + Selection of easily accessible dykes in resort/recreational areas | * + Probability: 3   + Impact:2   + Risk Level: Moderate |
| Impact of the environment on the project | * + Disturbance of construction activities and/or safety impacts due to weather conditions or extreme events. | * + Probability: 3   + Impact:3   + Risk Level: Moderate | * + Acquire weather forecasts, particularly storm events and avoid work and take appropriate measures during these periods. Such measures include securing the site, equipment and constructed components to withstand the event, as possible. | * + Probability: 3   + Impact:2   + Risk Level: Moderate |
| Output 2 | Erosion and Flooding Assessments | Mathematical Modelling | * + Insignificant Impacts (Office Work)   + Identification of the risks and hazards is the cornerstone towards development of any management plans. | * + Probability: 1   + Impact: 1   + Risk Level: Low | * + None required. | * + Probability: 1   + Impact: 1   + Risk Level: Low |
| Database Establishment |
| Hazard Assessment |
| Risk Assessment |
| Development of ICZM plan | Shoreline Master plan | * + Improper stakeholder participation could result in public unrest, which could negatively impact project accessibility (road blockage) and site activities.   + Performance problems and variances, following project implementation, may result in project failing to achieve its objectives. | * + Probability: 2   + Impact: 3   + Risk Level: Moderate | * + Setup a dynamic mechanism for identification and engagement of relevant stakeholders. Also setup a grievance mechanism to manage complaints.   + The monitoring system should cover: identification of expected performance, assessment and/or measurement of the actual performance of the program, establishment of performance variances, and procedure for communicating variances that exceed pre-established limits. | * + Probability: 1   + Impact: 2   + Risk Level: Low |
| Regulatory & Legislative Framework |
| Stakeholder Participation Strategy |
| Monitoring & Evaluation System |
| Capacity Building Programme | Capacity needs Assessment | * + Insignificant Impact.   + The project implementation team may lack essential operational experience. | * + Probability: 1   + Impact:1   + Risk Level: Low | * + Identify a training plan through conducting a capacity needs assessment.   + Include stakeholder representatives (EEAA, SPA and Ministry of water resources and irrigation) in a modular training program. | * + Probability: 1   + Impact:1   + Risk Level: Low |
| Knowledge Transfer |
| Modular Training Programme Design |
| Monitoring |
| National Observation System Implementation | | * + N/A | * + Probability: 1   + Impact:1   + Risk Level: Low | * + N/A | * + Probability: 1   + Impact:1   + Risk Level: Low |

### Assumptions Underpinning the Development of the Environmental and Social Management Framework

1. The following assumptions have been made in the preparation of this ESMF:

* none of the interventions will require the displacement of people;
* none of the interventions will be conducted in protected areas or sensitive locations;
* appropriate erosion and sediment control will be undertaken during all stages of the projects;
* no chemicals will be utilized in any of the construction or operation processes.
* Any fill material acquired from “other” locations will be dry.
* No contaminated fill material will be utilized

### Purpose and Objectives of the Environmental and Social Management Framework

1. An ESMF is a management tool used to assist in minimising social and environmental impacts; and establish a set of environmental and social objectives. To ensure the environmental and social objectives of the projects are met, this ESMF will be used by the project implementers to structure and control the environmental and social management safeguards that are required to avoid or mitigate adverse effects on the environment and communities.
2. The environmental and social objectives of the projects are to:

* reduce coastal flooding risks in Egypt’s North Coast due to the combination of sea level rise and more frequent extreme storm events;
* address the broader climate change adaptation challenges impacting in the area through the introduction of an integrated coastal zone management planning process;
* strengthen the capacity of the Egyptian Government and communities to manage the flooding impacts of climate change-induced sea level rise on coastal communities in the Nile Delta;and,
* align with Egypt’s priorities as outlined in its Nationally Determined Contribution to the Paris Agreement, as well as with Egypt’s Country Work Programme as submitted to the Green Climate Fund.

1. The environmental and social objectives of the ESMF are to:

* encourage good management practices through planning, commitment and continuous improvement of environmental practices;
* minimise or prevent the pollution of land, air and water;.
* protect existing flora, fauna and important ecosystems;
* comply with applicable laws, regulations and standards for the protection of the environment;
* identify key environmental and social indicators;
* engage with relevant stakeholders to manage their concerns;
* adopt the best practicable means available to prevent or minimise environmental impact;
* describe monitoring procedures required to identify impacts on the environment;
* provide an overview of the obligations of the project implementers; and
* introduce a grievance system to manage potential social impacts.

1. The ESMF will be updated from time to time by the implementing Project Management Unit (PMU)/contractor in consultation with the project board to incorporate changes in the detailed design phase of the projects.

### Land Issues

1. The lands utilized in the project are within the 200m SPA setback area, as per Law 48 for 1982. As such, there is no requirement for any compulsory land acquisition and/or compensation to be paid. Current uses of the lands are mainly for beach accessibility by fishermen, while beaches are also accessible for recreational activities at three of the target locations.

### Indigenous Peoples

1. As part of due diligence, an analysis and consultation is undertaken as to the Probability of any of the project’s activities involving indigenous people and/or ethnic minorities. No indigenous people and/or ethnic minorities are known to live in any of the proposed locations.

## Overview of Institutional Arrangements for the Environmental and Social Management Framework Plan

1. The ESMF will be assessed for each sub-project by the UNDP prior to any works being undertaken. The ESMF identifies potential risks to the environment and social matters from the projects and outlines strategies for managing those risks and minimising undesirable environmental and social impacts. Further, the ESMF provides a Grievance Redress Mechanism for those that may be impacted by the projects that do not consider their views have been heard.
2. The SPA will be responsible for the supervision of the ESMF. The UNDP will gain the endorsement of the SPA and will ensure the ESMF is adequate and followed. The PMU will ensure timely remedial actions are taken by the contractor where necessary.

### Administration

1. The SPA will be responsible for the revision or updates of this document during the course of work. It is the responsibility of the person to whom the document is issued to ensure it is updated.
2. The state project manager will be responsible for daily environmental inspections of the construction site. The SPA will cross check these inspections by undertaking monthly audits.
3. The contractor will maintain and keep all administrative and environmental records which would include a log of complaints together with records of any measures taken to mitigate the cause of the complaints.
4. The contractor will be responsible for the day to day compliance of the ESMF.
5. The SPA will be the implementing agency and will be responsible for the implementation and compliance with the ESMF via the collaborating partners and contractors. The ESMF will be part of any tender documentation.
6. The state Project Manager will supervise the contractor, while the SPA will be responsible for environment and social issues.

# Legal and Institutional Framework for Environmental and Social Matters

## Legislation, Policies and Regulations

1. The following legislation is relevant to the project:

### 2.1.1. Laws and Regulations

1. **Environment Law No. 4/1994 amended by Law No. 9/2009**
2. To protect the environment, a series of reforms have been taken by the Government of Egypt since the early 1980s. In the meantime the country has experienced fast economic and population growth bringing new environmental and socio-economic challenges. The endorsement of the first National Environmental Action (NEAP) in 1992 marked a turning point. As a result, an Environment Protection Law was enacted in 1994. The Egyptian Environmental Affairs Agency "EEAA" was established shortly thereafter and has gradually expanded its functions and responsibilities in all fields of environmental management. However, responsibilities for environmental protection in Egypt are distributed, among a number of Ministries and Governorates and can be classified in the following three categories:
3. The law includes article 69 which prohibits any establishment to throw any substance that is untreated into the environment that may in turn cause the pollution of sea shores or neighbouring waters. article 74 which forbids any action that may affect the natural coast line or modify its configuration unless agreed with the EEAA and the competent authority.
4. The Law, as amended, includes articles defining the coastal zones (art.1, item 39) as " the area extending from the coasts of Arab Republic of Egypt which encompasses the territorial sea, exclusive economic zone and continental shelf, and extending landward to areas of active interactions with the marine environment for that not exceeding 30 km in the desert areas, unless major topographical features interrupt this stretch, while in Nile Delta would extend up at contour (+3m). Each of the coastal governorates shall define their coastal zone according to its physical conditions and environmental resources, not in any case less than "10 km" landward from coast line ".
5. The executive regulations of the Law (prime minister’s decree 338/1995 and amended in several iterations afterwards) detail a number of issues relevant to coastal protection, development and management.
6. It also includes the setback line form the coast, as it states that “It shall be prohibited to issue permits for the construction of any installations on the sea shores of the Arab Republic of Egypt up to a distance of two hundred meters inwards from the shoreline, except after obtaining the approval of the Shores Protection Authority and EEAA approval (Article 59)” and that “It is prohibited to license any work that may affect the natural shoreline or modify its configuration either inwards or outwards or carry out related works, except after obtaining the approval of the Shores Protection Authority and EEAA approval (Article 60)”.
7. **Water Drainage and Irrigation Law No. 12/1984**
8. Under this law, article 86 stated that “the construction of any structures on the country’s northern coast overlooking the Mediterranean sea along its length from the republic western borders to its eastern ones for 200 meters inside the coastal water line is prohibited". Moreover, under article 87 of the same law the responsibility for determining the final prohibition line has been assigned to Shore Protection Authority "SPA". Based on its investigation, the setback area could be modified and has to be informed to all concerned authorities. Within the same law, article 88 highlights that approving certain establishments with special features are allowed under specific cases and upon prior approval from SPA as to include clear actions towards protecting the coasts.
9. **Natural Protectorates Law No. 102 of 1983**
10. According to this law, the Nature Conservation Sector within EEAA becomes the governmental body responsible for nature conservation in Egypt, entrusted with managing the National Protected Areas Network and coordinating management activities inside them. The law provides the legislative framework for establishing and managing Protected Areas within the different geographical regions of Egypt including coastal zones. This Law has clearly stipulated under article. 1 the definition of protected area as, “any area of Land, or coastal or inland water characterized by flora, fauna, and natural features having cultural, scientific, touristic or esthetic value. These areas will be designated and delineated by Prime Minister Decree upon the recommendation of the Egyptian Environmental Affairs Agency”. In addition, under article 2, it is prohibited to undertake actions (deeds or activities or undertakings) which will lead to the destruction or deterioration of the natural environment or harm the biota (terrestrial, marine or fresh water), or which will detract from the aesthetic standards within protected areas.
11. EEAA as the legal entity for applying such law is responsible for managing nearly 30 Protected Areas among which a number of coastal protectorates with different natural resources, where business and management plans are prepared and implemented.
12. Two sites of the project areas are located close to Ashtom el Gamil and El-Burullus protected areas.

* Regarding the Establishment of a natural reserve in the area of Ashtoum El-Gamil in Port Said governorate. The natural reserve is completely outside the project area, with the closest point above 1 km away;
* Establishes a natural reserve in the area of El-Burullus Lake in the governorate of Kafr El Sheikh. The natural reserve is completely outside the project boundaries, separated by the coastal international road.

1. **Law No. 48/1982 on Protection of the Nile River and Waterways from Pollution**
2. The Ministry of Water Resources and Irrigation (MWRI) has sole legal responsibility for the planning and management of water resources in Egypt. Law No. 48/1982 has defined the waterways as spatial zone for application to include (Nile River, drains, lakes, ponds, ground water). In addition, MWRI is responsible to control the discharge of wastes and wastewater into the Nile and waterways and sets standards for the quality of these discharge effluents. The Law prohibits discharges to the Nile, canals, lakes, drains, and ground waters without a license issued by the Ministry. Licenses are issued to factories, sanitary sewage treatment plants, and river boats, upon application, as long as the effluents meet certain standards and other conditions. Discharging without a license or discharging in amounts or concentrations that exceed license limits is punishable by fine, jail sentence, or both. This licensing procedure is conditioned according to criteria and cases set by MWRI based upon recommendation from the Minister of Health (MOH).
3. **Law No. 124/1983 on Fishing, Aquaculture and Regulate Fish Farms**
4. This law has been developed to regulate fishing, aquatic organisms harvest and regulating the establishment of fish farms. Consequently and according to the law the official responsible governmental entity in charge for implementing this law is General Authority for Fish Resources Development "GAFRD" affiliated to Ministry of Agriculture and Land Reclamation "MALR". Article 15 of the Law which deals with the water pollution and fishing constraints clearly prohibits any actions that could pollute the water where it states "without prejudice, as required under any other law, it is not allowed to throw or discharge industrial waste and pesticides used in combating agricultural pests and similar toxic or radioactive materials in the Egyptian waters. The Law defined "marine waters" as the territorial waters of the Arab Republic of Egypt. Accordingly, GAFRD has the legal power and responsibility of preserving and protecting the coastal water and marine resources.
5. **Law No. 106/2012 on amending some provisions of Law No. 38/1967 for General Public Cleaning**
6. Punishes any person who throw construction wastes on beaches without prejudice to any more severe penalties imposed by other laws by a mulct not less than 20.000 (twenty thousand) Egyptian Pounds and not more than 100.000 (one hundred thousand) Egyptian Pounds, or one of either above mentioned penalties, any person who throw wastes construction or demolition or excavation in public places, squares, tunnels, places other than those allocated by the local authorities, bridges, railways, archaeological sites, River Nile, canals, drains, beaches or their adjacent waters.
7. **Law No. 43/1979 on local administration system**
8. The nation is divided into local administration units are (Governorates, Markaz, Cities, Districts, Villages) each of them working on provision and management of all public utilities within the framework of national policy These exclude national facilities or special nature projects which establishment is by republican decree.
9. The governors are appointed by decree of the President of the Republic and represent the executive power to oversee the implementation of the national policy, provide services and utilities and ensure food security, and are responsible for raising agricultural and industrial productivity and have to take all procedures in these respects within the applicable laws and regulations
10. The Executive Council of Governorate, meeting on a monthly basis, is headed by the governor, and the membership of the secretary-general, aides of the governor, heads of Markaz, Cities and Districts, and the heads of public authorities. There are also executive councils at each Markaz, City and Village. These are the main vehicles to ensure coordinated actions at each of these administrative levels.

### 2.1.2. Relevant Presidential and Ministerial decrees:

1. **Prime Ministerial Decree No. 1095/2011, amending some provisions of the Executive Regulation of Law 4, issued by the prime ministerial decree no. 338/1995**
2. The executive regulations specified that the competent Minister for Environmental Affairs shall, after consulting the competent authorities, issue the environmental rules regulating the development of the coastal zone. The rules shall be updated periodically. It also stated that a local committee shall be formed by a decree of the Minister of Environmental Affairs and under the chairmanship of the Governor for the integrated management of coastal areas in each coastal governorate.
3. **Ministerial Decree No. 758/1972, promulgating the Executive Regulations of Law No. 66/1953 concerning mines and quarries (petroleum resources), issued by the Minister of Commerce and Industry**
4. Forbids discharging any oil polluting substances on the shores of the sea nor in public roads and water, taking into consideration that the seawater should not be polluted, and the Ministry of Industry is the body entrusted with the implementation of this decree.
5. **Ministerial Decree No. 447/1988, regulating the establishment of tourism projects in the north coast region of Egypt**
6. The decree provides rates and standards to be applied for tourist projects established at the north coast region. These include foot print, height, building density of buildings as well as population density. Its most relevant provision to the coastal land use is the following provision specifying a minimum setback of 100 m from the shore line
7. **Prime Ministerial Decree no. 1599/2006, concerned with the protection of Egyptian seashores that refers to "the Supreme Committee for Licenses on the Coastal area**
8. The seashores of the Arab Republic of Egypt at a distance of two hundred meters inwards from the shoreline are deemed vital areas for biodiversity. The Egyptian General Shore Protection Authority shall, in coordination with EEAA, exert supervision over coastal areas. It is prohibited to license the construction of any facility on the seashores except after obtaining the approval of the Egyptian General Authority for the Protection of Shores, in coordination with EEAA. Licenses and approvals must be obtained for any activity/ construction that might affect the shoreline (seawalls and offshore breakwaters, headlands, ports, marines) application shall be submitted in writing to the Ministry of irrigation and water resources, indicating the type of establishment to be constructed, attached with all requirement studies, designs and maps.
9. **Prime Minister Decree No.1599/2006 and its amendment by Prime Minister Decree No. 2299/2016.**
10. The decree No.1599 in 2006 was concerned with the establishment and the structure of The Supreme Licensing Committee (LSC) which is responsible for discussing and deciding about submitted projects, within the marine environment or that located inside the 200 meters from the shore line. In 2006 the Minister Decree No. 2299 was issued in order to amend it and the committee to be enlarged so that it includes further members from other concerned authorities. The new structure of the LSC with the ministerial level of representation is supported by technical secretariat chaired by SPA / chief with membership of 2 representatives from each ministry included in the LSC but at lower level of representation. The technical secretariat will be in charge for examining the projects, preparing the necessary reports and giving its recommendation as to be presented to LSC.
11. **Decree of the Minister of Housing, Utilities and Urban Development no. 144/2009, regarding the executive regulation of Unified Building Law issued by the law no. 119/2008**
12. The decree states, land subdivision projects which are related to the lands with a special nature such as lands which are located by the waterfronts of rivers, seas, lakes or water streams must have supplementary rules for its subdivision process. The rules are being set through coordination with the related authorities such as EEAA. Accordingly, the rules include;

* Performing lowlands backfilling and soil sampling analysis, choosing an adequate backfilling material and grading procedures.
* Surface water disposal mechanism.
* Providing access paths to the waterfront for landowners, publics, and rear lands owners.
* Providing data for water's levels and depths and the slopes of the shore area.
* Determining the specifications of water blocks, bridges, and dams which are used to prevent beaches erosion.
* Determining all necessary markings and signs which indicate to prohibited areas for sportive activities.
* States the special requirements which have been issued by the responsible agencies for water resources protection.

1. **Presidential Decree No. 108/2000, on State-owned lands which lie within the Nile Valley and Delta, as a designated area for the establishment of new urban communities**
2. State-owned lands which lie within the Nile Valley and Delta, as a designated area for the establishment of new urban communities in accordance with Law no. 59/1979, 7/1991. This area extends from a distance of 5 Kilometers south the international road to the cost of the Mediterranean Sea at the north, with the exception of lands lie within existing lands.
3. **Prime ministerial decree no. 206/1997, on the area in Gamsa city, south of the coastal international highway in Dakahliya, as an industrial zone in accordance with the provisions of the Investment Guarantees and Incentives law**
4. The area in Gamsa city, which has an area of 727 acres and 14 carat, south of the coastal international highway in Dakahleya, as an industrial zone in accordance with the provisions of the Investment Guarantees and Incentives law no. 230/1989.
5. **Prime Ministerial Decree no. 250/1999, Establishes a public free zone for warehouse projects in Damietta**

### 2.1.3. FRAMEWORKS, PLANS AND STRATEGIES

1. **Sustainable development strategy 2030**
2. The latest major planning document was “Egypt’s sustainable development strategy 2030” developed by the ministry of Planning in January 2014 and launched in 2016. The aim is to create a plan that would help in reaching optimal benefits from sustainable resource management and improving the life of Egyptians. The strategy was developed through a participatory approach which includes ministers, experts, private parties and researchers as well as a number of international organizations.
3. It assessed the current situation in Egypt in terms of economy and environment such as water, air, biodiversity, minerals, coastal ecosystem, wastes and international conventions Egypt participated in. In addition, challenges such as poor protection of the coast against climate change threats are noted.
4. Projects in the document related to the North Coast clearly reflect the aim to develop and protect. These include:

* Coastal protection tools to preserve the Northern lakes and prevent erosion of the beach due to the increase of sea level.
* Enhancing coastal and marine zones is a project to face challenges affecting coastal and marine areas such as oil exploration urban, industrial, agricultural, and touristic expansion through developing plans for sustainable tourism and through developing strict management. The strategy suggests a program to adapt to threats by climate change, and especially in densely populated areas, promote sustainable fishing, and sustainable tourism etc. in cooperation with the private sector and civil society.

1. **National strategy for adaptation to climate change and Disaster risk reduction**
2. The Egyptian strategy for adaptation to climate change and Disaster risk reduction provided by Egypt’s Cabinet Information and Decision Support Centre (IDSC) and the UNDP (2011) described the effects of climate change on water resources, agricultural sector, health sector, urbanization, coastal zones and tourism. The strategy aims to protect from and adapt to Climate Change as a defense mechanism against global warming with pre-fixed plans in order to be prepared for any natural catastrophe that might affect coastal areas. The plans will be set based on anticipation and meteorological scenarios.
3. Among the suggested strategies to tackle climate change and sea level rise effects on vulnerable coastal areas:

* Constructing sustainable protection bodies and strengthening previous ones such as shore coating, barriers to protect coastal cities and roads from sea water penetration
* Use artificial nourishment with sand to replace eroded beach zones
* Maintaining natural barriers such as coastal dunes and coral reefs.

1. **ICZM Strategy**
2. In 2009, EEAA prepared in cooperation with the Priority Actions Programme Regional Activity Centre (PAP/RAC) of the Mediterranean Action Plan (MAP) a national strategy for Integrated Coastal Zone Management (ICZM) in Egypt.
3. The strategy presented major challenges facing the country such as the Impact of climate change (erosion, seawater intrusion, flooding), destruction of coastal habitats, degraded fishing resources, irrational land use, and the deterioration of water quality.
4. The strategy proposed three strategic objectives to overcome the previous challenges:

* Strengthening ICZM policy by better coordination
* Planning a sustainable use of coastal resources
* Promoting stakeholders’ awareness

1. **National Environmental Action Plan 2002-2017**
2. EEAA has prepared an updated National Environmental Action Plan "NEAP" in 2001 employing a participatory and consultative planning modality to reach consensus on issues and priorities, and directions for future actions. Six main issues were highlighted (Water, Air, Land, Waste, Global Environmental Issues, Supportive Measures). Programs and projects proposed to address these issues included preventive and/or corrective measures and supportive measures. The NEAP includes a program for managing national marine and coastal zones.
3. **The ICZM Framework**
4. The 1996 framework program for National Integrated Coastal Zone Management Plan "NICZMP" was the first comprehensive document prepared by the national committee of ICZM discussing ICZM in Egypt at national level. It highlighted important characteristics of the coastal zone and provided an overview of challenging problems and issues.

## Environmental Impact Assessment In Egypt

1. According to Law 4/1994, Law of the Environment, and its executive regulations (ERs), the project proponent must prepare an Environmental Impact Assessment (EIA) with the application for license of new projects and/or extension of existing facilities. Accordingly, environmental requirements are integrated into the existing licensing system.

### Environmental Impact Assessment Process

1. According to the law, the EIA must be submitted to the Competent Administrative Authority (CAA), under which jurisdiction the project falls. The CAA should assess the environmental impacts of the project and send the EIA to EEAA to issue its response within 30 days. If no response is received beyond this period, the study is automatically approved. The proponent is informed of the decision and, in the event of an approval, the requiring conditions for both construction and operation phases. The proponent has the right to issue an appeal within 30 days from the receipt of the decision.
2. According to the Egyptian Guidelines for ESIA (EEAA, 2009), proposed developments are classified to four categories according to the severity of potential impacts. They reflect the increasing level of environmental impact assessment. The three categories[[6]](#footnote-6) are:

* **Category A:** projects with minor environmental impacts
* **Category B Scope:** projects with substantial impacts with focus on specific project activities/components
* **Category B:** projects with substantial impacts
* **Category C:** projects with high potential impacts requiring full ESIA

1. The current project does not fall under the lists prepared by the EEAA. In such cases, a preliminary meeting takes place with the EEAA to agree the categorization. However, it is expected that projects of this nature would be a cetegory B scope project.

## Multilateral Agreements and Biodiversity Protocols

1. Egypt is a signatory to a number of international and regional agreements and conventions, which are related to the environment. They include:
2. Paris Agreement for strengthening global response to climate change threats, signed in April 2016

* Brings together nations to fight climate change and adapt to it while helping developing countries to do so without ignoring their national objectives. It globally aims to keep an overall temperature rise of less than 2° C this year and to pursue more efforts to lower the increase of rise even further by 1.5 ° C. The agreement provides appropriate financial help, an innovative technology framework and capacity building.

1. The conservation of Small Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic area (ACCOBAMS), 1996 Egypt ratified the agreement on 4 March 2010 and it was put into force on 1 July 2010.

* A special agreement under the Bonn Convention that was made in 1996 and entered into force in 2001. It is the first consensus that integrated those regions to work on one common goal. The agreement recognizes that cetaceans are a crucial part of the marine environment and that it is necessary to conserve them and maintain their ecological benefits. Their conservation is a common concern and thus the agreement recognizes the importance of integrating management activities related socio-economic progresses such as fishing, marine activities etc.

1. The London convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, The protocol was ratified by Egypt and entered into force on 24 March 2006

* Came into force in 1975 and is now superseded by its 1996 Dumping Protocol. The main goal is to protect the marine ecosystem and improve sustainable resource usage. In this regard, both the convention and the protocol aimed to manage and restrict any marine pollution source through the provision of two waste lists; grey and black. The black list includes all the prohibited materials and the grey list includes the materials that can be dumped into the sea but requires following specific guidelines and obtaining a special permission from statutory bodies. Dumping any materials that are not on the list needs a general permission. In addition to this common goal, the newly formed protocol is sterner than the convention in terms of requiring a general precautionary approach, a reverse list approach that forbids all waste with an exception of obtaining a clearly stated permission, waste incineration/combustion treatment by the sea is forbidden. Technical guidelines and procedures are provided for the newly involved stakeholders.

1. Stockholm Convention on Persistent Organic Pollutants (POPs),2000 Egypt signed the agreement on 17 May 2002, ratified it on 2 May 2003 and it was put into force in the country on 17 May 2004.

* The convention was adopted at the meeting of the intergovernmental negotiating committee for an international legally binding instrument for implementing international action on certain persistent organic pollutants in Johannesburg (December 2000). It recognizes that POPs are easily transported through evaporation and deposition. It also recognizes that many countries use a high amount of POPs. For instance, the African. Sahel countries apply a high amount of pesticides that are later on deposited in further away areas such as the Caribbean sea and in turn causes its pollution of their sea .The objective of this Convention is to protect human health and the environment from persistent organic pollutants. The selected list of POPs is of direct relevance to the UNEP assessment of Persistent Toxic Substances "PTSs".

1. The Conservation of African-Eurasian Migratory Water birds (AEWA), 1995 Egypt ratified the convention on 1 January 1999

* A regional agreement part of the Bonn convention which entered into force on that aims to conserve migratory waterbirds and their habitats in many regions; Africa, Europe, the Middle East , Canadian Archipelago, Central Asia and Greenland but targets also international conservation efforts. It includes 225 birds that depend on wetlands.

1. The United Nations Framework Convention on Climate Change (UNFCCC) 1992, Egypt signed this convention on 9 June 1992 and ratified it on 5 December 1994. It entered into force on 5 March 1995.

* It provides an intergovernmental framework to face climate change issues. Recognizing that the climate is a common shared resource affected by anthropogenic human emissions. It recognizes the importance of marine environments as well as terrestrial ones in acting as reservoirs for Carbon and greenhouse gases. It also emphasizes the importance of scientific, economic and practical sectors in tackling climate change problems and the importance of continuous monitoring and assessment.

1. [Kyoto Protocol](javascript:__doPostBack('dnn$ctr933$View$ListViewConvName$ctrl1$LinkButtonMore','')) setting internationally binding emission reduction targets, ratified in December 2005. Which is an agreement to the UNFCC convention.

* The protocol aims to commit its joined parties to specific international emission targets and aims to strengthen the global response to temperature rise. It recognizes that currently developed countries are the main cause of the presently high emissions of GHG in the atmosphere a result of 150 industrial years. It provides flexibility on how the countries reach their target (eg: increase in forests to compensate their emissions)

1. Global Convention on the Protection of Biological Diversity, 1992 Egypt ratified the convention on 31 August 1994.

* It recognizes the importance of biological diversity in offering ecosystem services such as re-creational, ecological, economic, educational services etc. and its importance in maintaining life. The convention emphasizes that countries and states are responsible to preserve their biological diversity and that specific human activities negatively affects their presence. It also recognizes the challenge in lack of information and studies. It as well emphasizes the importance of in-situ conservation to maintain biodiversity and notes that ex-situ conservation also has a role in its preservation. It recognizes as well that the priority of developing countries include social and economic progress and lowering poverty. It highlights the importance of sustainable use as the answer to poverty elimination and development.

1. [UN Framework convention on Climate change (UNFCCC)](javascript:__doPostBack('dnn$ctr933$View$ListViewConvName$ctrl0$LinkButtonMore','')), ratified in May 1994

* Recognizing that the climate is a common shared resource affected by anthropogenic human emissions. It recognizes the importance of marine environments as well as terrestrial ones in acting as reservoirs for Carbon and greenhouse gases. It also emphasizes the importance of scientific economic and practical sectors in tackling climate change problems and the importance of continuous monitoring and assessment

1. [Vienna Convention on the protection of the ozone layer](javascript:__doPostBack('dnn$ctr933$View$ListViewConvName$ctrl2$LinkButtonMore','')), ratified in May 1988

* Its objective is to protect human health and the environment from anthropological effects that could modify the ozone layer. It encourages international cooperation and exchange in knowledge between countries. The most important aspect is that signatory countries agreed to act upon future environmental problems before its effects were observed or proven. The protocol mainly focuses on the reduction in production and consumption of ozone depleting substances (ODS) listed in four annexes.

1. [Montreal Protocol on substances that deplete the ozone layer](javascript:__doPostBack('dnn$ctr933$View$ListViewConvName$ctrl3$LinkButtonMore','')), ratified in February 1988

* The protocol aims to gradually diminish the use (production and consumption) of ozone depleting substances in order to avoid damaging the ozone layer. It provides an obligatory time-table for the involved parties to stop using those substances. The phase out date is reviewed and modified based on scientific advances. Multilateral Fund is created to aid developing countries to reach their phase out goals. It was amended multiple times and the amendments included more ozone depleting substances. The latest amendment was the Beijing 1999.

1. RAMSAR Convention on Wetlands of International Importance Especially as Waterfowl Habitat, 1971 Egypt ratified the convention on 9 September 1988 and it was put into force on the same date.

* The agreement recognizes the inter-dependence of humans and the ecosystem. It also recognizes the importance of wetlands in regulating water flow as well as associated animals and plants such as waterfowl. It emphasizes as well the economic, social, recreational and scientific importance of wetlands.

1. The Law of the Sea, 1982. Egypt was one of the first countries who ratified it on 26 August 1983.

* The Law of the Sea Convention defines the rights and responsibilities of nations with respect to their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine resources. It also recognizes that marine problems are inter-related and emphasizes on the need for an integrated management. Under the United Nations Convention on the Law of the Sea “States have the obligation to protect and preserve the marine environment” (Art. 192) taking measures “necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life” (Art. 194, para. 5).

1. The Bonn Convention on the Conservation of Migratory Species of Wild Animals, 1979 Egypt ratified the convention on 11 February 1982 and it was put into effect on 1 November 1983.

* Aims to globally conserve aquatic, terrestrial and avian migratory animals and it recognizes their crucial role in the stability of the ecosystem It recognizes that all boundaries where the species occur or pass through needs to be managed.

1. The Barcelona Convention, 1976 Egypt first signed the Barcelona convention on the 16 February 1976. Shortly after, it ratified and approved the Barcelona convention on 24 August 1978 and accepted its amendment on 11 February 2000 which entered to force on 9 July 2004.

* Aims to protect the Mediterranean sea from pollution.. Since 1995, several components of the Barcelona system have undergone important changes. The objective of the revision was to modernize the Convention to bring it in line with the principles of the Rio Declaration, the philosophy of the new Convention on the Law of the Sea (see section 1.2 below) and the progress achieved in international environmental law in order to make it an instrument of sustainable development. The revised Convention also aimed to progress from an essentially proclamatory form of law to a more prescriptive law setting out obligations. The scope of its protocols was extended and new protocols were adopted either to replace the existing ones or to cover new fields of cooperation. In addition, in order to ensure the effectiveness of the new provisions, the need for new capacities as well as public participation and access to information including the adoption of a reporting procedure was part of the revision process.
* The present Barcelona structure includes the following related instruments;
* **The Protocol Concerning Specially Protected Areas** Egypt has signed the replacement protocol on 10 June 1995 and ratified it on 11 February 2000. The protocol entered into force on 12 March 2000
* **The protocol** Concerning Mediterranean specially protected areas (Geneva, 1 April 1982; in force since 23 March 1986), was signed by Egypt on 16 February 1983 and ratified on 8 July 1983 and entered into force on 23 March 1986 .It was replaced by the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean "the SPA and Biodiversity Protocol", signed in Barcelona on 10 June 1995, (in force since 12 December 1999).
* **The Land Based Sources Protocol “LBS” ,** Egypt ratified the protocol on 18 May 1983; however, it did not sign the amendment yet
* For the protection of the Mediterranean Sea against pollution from land-based sources (Athens, 17 May 1980; in force since 17 June 1983). The protocol was amended in Syracuse on 7 March 1996, changes its name to the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities, “the LBS Protocol” (in force since 11 May 2008),. LBS applies to discharges originating from land based point and diffuse sources and activities in the Mediterranean, such discharges reach the sea through coastal disposals, rivers, outfalls, canals or other watercourses, including ground water flow, or **through** run-off and disposal under the seabed with access from land;

1. World Heritage Convention, 1972, Egypt ratified the convention on 7 February 1974.

* Sets guidelines for parties to help them identify locations that can be world heritage sites and means to conserve them. Every state is required to protect the natural heritage. Regional frameworks, scientific research, and giving the heritage a cultural function for the community are encouraged. The convention provides managing guidelines and possibly financial assistance. Moreover, raising awareness and education is also encouraged in order to improve the protection of those sites.

# Implementation and operation

## General Management Structure and Responsibilities

1. The proposed project's implementation arrangements will be designed consistent with lessons learned in the several successfully-implemented climate change projects in Egypt. The project will be implemented following UNDP’s NIM, according to the Standard Basic Assistance Agreement (SBAA) between UNDP and the GoE and as policies and procedures outlined in the UNDP POPP.

(see <https://info.undp.org/global/popp/ppm/Pages/Defining-a-Project.aspx>).

1. The (national) Implementing Partner/Executing Entity for this project is the SPA which is accountable to UNDP for managing the project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of resources made available by UNDP.
2. The SPA is responsible for managing the shoreline in coastal areas that have socioeconomic value or natural resource value that are threatened by erosion. It develops coastal zone management plans, designs projects for shore protection, and issues license for projects located in the coastal zone area in collaboration with The Egyptian Environmental Affairs Agency (EEAA). The organization is a key player in the implementation of project activities because its experience in coastal protection structures and planning activities in the North Coast. SPA falls directly under the MWRI and was established in 1981 by Presidential Decree N. 261. SPA has two branches: i) Research & Development and ii) Execution. SPA has seven administrations, four of them located at the north coast of Egypt near some of the hotspot sites. About 400 people work in SPA, 100 of them correspond to engineers who are actively engaged in monitoring conditions along the Mediterranean coast. SPA is responsible for the erosion control throughout the north coast of Egypt. The main responsibility of SPA is to manage the shoreline in those coastal areas, which have socioeconomic value or natural resource value that are threatened by erosion. The activities performed by SPA focus on designing projects and studies for shore protection, monitoring coastal processes, and issuing license for projects located in the coastal zone areas, in collaboration with EEAA. Additionally, SPA participates in the development of coastal management plans.
3. The duration of the proposed project is 7 years. The management arrangements for this project are summarized below:

**Project Board**

National Project Director

(appointed by MWRI)

Deputy Minister of MWRI

Technical Advisory Team

(MWRI, SPA, CoRI, EEAA, NGOs)

Senior Supplier

UNDP

Project Assurance (UNDP)

Senior beneficiaries

(SPA, CoRI, EEAA)

Executive

Minister of MWRI

Project Support Team

(Chief Technical Advisor, Finance Officer, Admin Officer, Technical Specialists)

Project Manager

(Recruited by GoE and reporting to MWRI and UNDP)

Figure 4: Project organisation structure

### Project Board

1. The project will be governed by a Project Board/steering committee. The Board will consist of a group of representatives responsible for making consensus-based strategic and management decisions for the project. It will oversee the project implementation; review compliance with GoE, UNDP and GCF requirements; and ensure implementation of the management plan for the risks identified. The Board will be comprised of:

* An Executive (role represented by National Implementing Partner) that holds the project ownership and chairs the Board. The Executive will be the Minister of the SPA;
* A Senior Supplier representative providing guidance regarding the technical feasibility of the project, compliance with donor requirements, and rules pertaining to use of project resources. This role will be fulfilled by UNDP in its capacity as GCF IA;
* Senior Beneficiary representatives who ensures the realization of project benefits from the perspective of project beneficiaries; and,
* The National Project Director, Assistant Chief Executive Officer (ACEO) of CRICU, who is responsible for overall direction, strategic guidance, and timely delivery of project outputs.

1. The Board will also include additional membership including representatives from relevant GoE ministries, Development Partners, NGOs and the Egyptian NDA for the GCF. The Board will meet once every six months and/or upon a call by the National Project Director.
2. Specific responsibilities of the Project Board include:

* Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
* Address project issues as raised by the project manager;
* Provide guidance on new project risks, and agree on possible countermeasures and management actions to address specific risks;
* Review the project progress, and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily per plans;
* Appraise the annual project implementation report, including the quality assessment rating report; make recommendations for the work plan;
* Provide ad hoc direction and advice for exceptional situations when the project manager’s tolerances are exceeded; and,
* Assess and decide to proceed on project changes through appropriate revisions.

### Project Management Unit (PMU)

1. The PMU is composed of the National Project Manager, Finance and Administrative Associate, a Monitoring, Evaluation and Reporting Officer. The PMU is responsible for the day to day management of the project activities and is accountable to the Project Board. The Project Management Unit’s overall role will be to ensure comprehensive technical and management support is provided to project activities and local beneficiaries, such as overseeing knowledge management and Monitoring and Evaluation. The PMU must have adequate multi-disciplinary technical capacity to be able to support technical, financial and climate change adaptation-related activities. Thus, the PMU team must be able to work with a large range of natural resources, economic, policy and organizational issues, and can ensure that activities are designed and implemented in-line with national and international best practices.
2. Using established practice under NIM, GoS will designate a National Project Director (NPD) who will be the ACEO of CRICU. The NPD will provide up to 50% of his/her time, and be responsible for the overall direction, strategic guidance, and timely delivery of project outputs. This position is not remunerated by GCF resources but it is a Governmental financed position. Specific responsibilities include:

* Finance and Administrative Associate
* Monitoring, Evaluation and Reporting Officer

### Technical Advisory Team

1. The Technical Advisory Team (TAT) consists of technical level staff from all Ministries and NGOs, represented on the Project Board. It will provide the platform for debate and contributions across the project outputs at a more technical and working level.

### Programme Analyst (UNDP)

* We need Data from Client

### Government Project Coordinator

* We need Data from Client

### Project Team

1. SPA will recruit a state Project Manager (PM) who will be responsible for day-to-day operations and the management of a team of professionals and technical staff (who will also be recruited by UNDP to implement the project).
2. The PM will be supported by a core team of technical and support staff forming the Project Implementation Unit (PIU) located at the MWRI to execute project activities, including day-to-day operations of the project, and the overall operational and financial management and reporting.

### Project Assurance

1. UNDP provides a three – tier oversight and quality assurance role involving UNDP staff in Country Offices and at regional and headquarters levels. The quality assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. Project Assurance must be independent of the Project Management function; the Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager.  The project assurance role is covered by the accredited entity fee provided by the GCF. As an Accredited Entity to the GCF, UNDP is required to deliver GCF-specific oversight and quality assurance services including: (i) Day-to-day oversight supervision, (ii) Oversight of project completion, (iii) Oversight of project reporting. The ‘senior supplier’ role of UNDP is to represent the interests of the parties, which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The senior supplier’s primary function within the Board is to provide guidance regarding the technical feasibility of the project.

## Project Delivery and Administration

### Project Delivery

1. The project will be delivered on the ground via the SPA through its subsidiary departments. In addition, collaboration with atoll councils, existing NGOs and local communities is expected.

### Administration of Environmental and Social Management Framework

1. As the implementing agency, SPA will be responsible for the implementation with the EEAA via the delivery organisations.
2. The ESMF will be part of any tender documentation. The SPA will be responsible for the revision or updates of this document during the course of work. It is the responsibility of the person to whom the document is issued to ensure it is the most up to date version.
3. The UNDP and SPA are accountable for the provision of specialist advice on environmental and social issues to the delivery organisations (eg contractors and/or NGOs) and for environmental and social monitoring and reporting. SPA or its delegate will assess the environmental and social performance of the delivery organisations (eg contractors) in charge of delivering each component throughout the project and ensure compliance with the ESMF. During operations the delivery organisations will be accountable for implementation of the ESMF. Personnel working on the projects have accountability for preventing or minimising environmental and social impacts.
4. The Field Officer will be responsible for daily environmental inspections of the project/construction site. The SPA or its delegate will cross check these inspections by undertaking monthly audits.
5. The delivery organisation eg contractor will maintain and keep all administrative and environmental records, which would include a log of complaints together with records of any measures taken to mitigate the cause of the complaints.
6. The delivery organisation will be responsible for the day to day compliance of the ESMF

### Environmental procedures, site and activity-specific work plans/instructions

1. Environmental procedures provide a written method describing how the management objectives for a particular environmental element are to be obtained. They contain the necessary detail to be site or activity-specific and are required to be followed for all construction works. Site and activity-specific work plans and instructions are to be issued and will follow the previously successful work undertaking similar projects by the UNDP.

### Environmental incident reporting

1. Any incidents, including non-conformances to the procedures of the ESMF are to be recorded using an Incident Record and the details used in a register. For any incident that causes or has the potential to cause serious environmental harm, the camp officer shall notify the Project Manager as soon as possible. The delivery organisation/contractor must cease work until remediation has been completed as per the approval of SPA.

### Daily and weekly environmental inspection checklists

1. A daily environmental checklist is to be completed at each work site by the relevant state project manager and maintained within a register. A weekly environmental checklist is to be completed and will include reference to any issues identified in the daily checklists completed by the field officers. The completed checklist is to be forwarded to SPA for review and follow-up if any issues are identified.

### Corrective Actions

1. Any non-conformances to the ESMF are to be noted in weekly environmental inspections and logged into the register. Depending on the severity of the non- conformance, the camp officer may specify a corrective action on the weekly site inspection report. The progress of all corrective actions will be tracked using the register. Any non-conformances and the issue of corrective actions are to be advised to SPA.

### Review and auditing

1. The project will be audited in accordance with UNDP policies and procedures on audits, informed by and together with any specific requirements agreed in the AMA. Per the current audit policies, UNDP will be appointing the auditors. In UNDP scheduled audits are performed during the programme cycle as per UNDP assurance/audit plans, based on the implementing partner's risk rating and UNDP’s guidelines. A scheduled audit is used to determine whether the funds transferred to the implementing partner were used for the appropriate purpose and in accordance with the work plan. A scheduled audit can consist of a financial audit or an internal control audit.
2. The ESMF and its procedures are to be reviewed at least every two monthsby UNDP staff and SPA. The objective of the review is to update the document to reflect knowledge gained during the course of project delivery/construction and to reflect new knowledge and changed community standards (values).
3. The ESMF will be reviewed and amendments made if:

* There are relevant changes to environmental conditions or generally accepted environmental practices; or
* New or previously unidentified environmental risks are identified; or
* Information from the project monitoring and surveillance methods indicate that current control measures require amendment to be effective; or
* There are changes to environmental legislation that are relevant to the project; or
* There is a request made by a relevant regulatory authority.

1. Any changes are to be developed and implemented in consultation with UNDP Staff and SPA. When an update is made, all site personnel are to be made aware of the revision as soon as possible eg through a tool box meeting or written notification.

## Training

### General Training

1. Delivery organisations have the responsibility for ensuring systems are in place so that relevant employees, contractors and other workers are aware of the environmental and social requirements for construction, including the ESMF.
2. All project personnel will attend an induction that covers health, safety, environment and cultural requirements.

### Specialized Training

1. All workers engaged in any activity with the potential to cause serious environmental harm (e.g. handling of hazardous materials) will receive task specific environmental training.
2. Training to build capacity in the application of high resolution modelling techniques, maintenance of soft coastal protection structures, and maintenance of all coastal monitoring equipment
3. Design and implementation of modular training program for MWRI/SPA and EEAA to build skills for professional development of coastal management practitioners, in a diversity of capacities (e.g. policy positions or day-to-day management).
4. Design and implementation of the modular training program for other stakeholders to be able to collaborate and actively participate in the implementation of the ICZM Plan.

# Communication

## Public consultation and Environmental and Social Disclosure

1. Consultations will take place as part of the stakeholder engagement plan. A meeting took place on 25 May 2017 (see Figure 2) with the Representative of the Minister of Irrigation and Water Resources, relevant members of the Parliament, Secretariats of the relevant governorates to the project location(s), representatives of the SPA and Project. The purpose of this meeting was to introduce the project and define high-level concerns. The meeting also aimed at agreeing and refining a stakeholder list to be consulted during the scope of the current study. A preliminary list of stakeholders was prepared and discussed. The agreed-upon list is presented in the following table:

Table 5: Preliminary list of Stakeholders

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Stakeholder** | **Reason** | **Port Said** | **Damietta** | **Dakahlia** | **Kafr El Skeikh** | **El Beheira** |
| Fishermen Community | Sea Accessibility | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Bird Poachers | Shore Accessibility | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Farmers | Protecting and increasing agricultural areas via minimizing climate change impacts |  |  |  | **🗸** | **🗸** |
| Utilization of dredged materials from lakes | **🗸** | **🗸** | **🗸** | **🗸** |  |
| Fish Farms | Protecting and increasing fish farm areas via minimizing climate change impacts | **🗸** |  |  | **🗸** |  |
| National Company for Fish Farming |  | **🗸** |  |  | **🗸** |  |
| General Authority for fisheries Resources Development |  | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Resorts and Recreational Beaches | Beach Accessibility |  | **🗸** | **🗸** |  |  |
| Urban Areas near the Sea | Beach Accessibility | **🗸** |  | **🗸** | **🗸** |  |
| Protecting and increasing urban areas via minimizing climate change impacts |  |  | **🗸** | **🗸** |  |
| Work Opportunities | **🗸** | **🗸** | **🗸** | **🗸** |  |
| Industrial Areas | Protecting and increasing industrial areas via minimizing climate change impacts | **🗸** |  |  |  |  |
| Power Plant | Sensitivity to climate change impacts |  | **🗸** |  | **🗸** |  |
| Non-Governmental Organizations | Provision of trained labour | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Scientific Communities | Interested parties | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Coast Guards | Relevant security party | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Environment and Surface Water Police | Relevant security party | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Marginalized Groups | Face difficulties to express their concerns | **🗸** | **🗸** | **🗸** | **🗸** | **🗸** |
| Others |  |  |  |  |  |  |

1. The SPA will arrange further meetings with focus groups from the relevant governorates to include fishermen, community members and representatives of NGOs, as available. It is expected that consultation with any affected communities will continue through the course of the project. It is anticipated that based on the communities’ needs, the projects’ will be fully accepted.
2. The UNDP and SPA will develop and release updates on the project on a regular basis to provide interested stakeholders with information on project status. Updates may be via a range of media eg print, radio, social media or formal reports. A publicized telephone number will be maintained throughout the project to serve as a point of contact for enquiries, concern, complaints and/or grievances. All enquiries, concern, complaints and/or grievances will be recorded on a register and the appropriate manager will be informed. All material must be published in English and Arabic as appropriate.
3. Where there is a community issue raised, the following information will be recorded:
4. time, date and nature of enquiry, concern, complaints and/or grievances;
5. type of communication (e.g. telephone, letter, personal contact);
6. name, contact address and contact number;
7. response and investigation undertaken as a result of the enquiry, concern, complaints and/or grievances; and
8. actions taken and name of the person taking action.
9. Some enquiries, concerns, complaints and/or grievances may require an extended period to address. The complainant(s) will be kept informed of progress towards rectifying the concern. All enquiries, concerns, complaints and/or grievances will be investigated and a response given to the complainant in a timely manner. A grievance redress mechanism has been included in the ESMF to address any complaints that may not be able to be resolved quickly.
10. Nominated PMU/contractor staff will be responsible for undertaking a review of all enquiries, concern, complaints and/or grievances and ensuring progress toward resolution of each matter.

## Complaints Register and Grievance Redress Mechanism

1. During the construction and implementation phases of any project, a person or group of people can be adversely affected, directly or indirectly due to the project activities. The grievances that may arise can be related to social issues such as eligibility criteria and entitlements, disruption of services, temporary or permanent loss of livelihoods and other social and cultural issues. Grievances may also be related to environmental issues such as excessive dust generation, damages to infrastructure due to construction related vibrations or transportation of raw material, noise, traffic congestions, decrease in quality or quantity of private/ public surface/ ground water resources during irrigation rehabilitation, damage to home gardens and agricultural lands etc.
2. Should such a situation arise, there must be a mechanism through which affected parties can resolve such issues in a cordial manner with the project personnel in an efficient, unbiased, transparent, timely and cost-effective manner. To achieve this objective, a grievance redress mechanism has been included in ESMF for this project.
3. The project allows those that have a complaint or that feel aggrieved by the project to be able to communicate their concern, complaints and/or grievances through an appropriate process. The Complaints Register and Grievance Redress Mechanism set out in this ESMF are to be used as part of the project and will provide an accessible, rapid, fair and effective response to concerned stakeholders, especially any vulnerable group who often lack access to formal legal regimes.
4. While recognising that many complaints may be resolved immediately, the Complaints Register and Grievance Redress Mechanism set out in this ESMF encourages mutually acceptable resolution of issues as they arise. The Complaints Register and Grievance Redress Mechanism set out in this ESMF has been designed to:

* be a legitimate process that allows for trust to be built between stakeholder groups and assures stakeholders that their concerns will be assessed in a fair and transparent manner;
* allow simple and streamlined access to the Complaints Register and Grievance Redress Mechanism for all stakeholders and provide adequate assistance for those that may have faced barriers in the past to be able to raise their concerns;
* provide clear and known procedures for each stage of the Grievance Redress Mechanism process, and provides clarity on the types of outcomes available to individuals and groups;
* ensure equitable treatment to all concerned and aggrieved individuals and groups through a consistent, formal approach that, is fair, informed and respectful to a concern, complaints and/or grievances;
* to provide a transparent approach, by keeping any aggrieved individual/group informed of the progress of their complaint, the information that was used when assessing their complaint and information about the mechanisms that will be used to address it; and,
* enable continuous learning and improvements to the Grievance Redress Mechanism. Through continued assessment, the learnings may reduce potential complaints and grievances.

1. Eligibility criteria for the Grievance Redress Mechanism include:

* Perceived negative economic, social or environmental impact on an individual and/or group, or concern about the potential to cause an impact;
* clearly specified kind of impact that has occurred or has the potential to occur; and explanation of how the project caused or may cause such impact; and,
* individual and/or group filing of a complaint and/or grievance is impacted, or at risk of being impacted; or the individual and/or group filing a complaint and/or grievance demonstrates that it has authority from an individual and or group that have been or may potentially be impacted on to represent their interest.

1. Local communities and other interested stakeholders may raise a grievance/complaint at all times to the SPA. Affected local communities should be informed about the ESMF provisions, including its grievance mechanism and how to make a complaint.

### Complaints Register

1. Where there is a community issue raised, the following information will be recorded:

* A complaints register will be established as part of the project to record any concerns raised by the community during construction. Any complaint will be advised to the UNDP and SPA within 24 hours of receiving the complaint. The complaint will be screened. Following the screening, complaints regarding corrupt practices will be referred to the UNDP for commentary and/or advice along with the SPA.
* Wherever possible, the project team will seek to resolve the complaint as soon as possible, and thus avoid escalation of issues. However, where a complaint cannot be readily resolved, then it must be escalated.
* A summary list of complaints received and their disposition must be published in a report produced every six months.

### Grievance Redress Mechanism

1. The Grievance Redress Mechanism has been designed to be problem-solving mechanism with voluntary good-faith efforts. The Grievance Redress Mechanism is not a substitute for the legal process. The Grievance Redress Mechanism will as far as practicable, try to resolve complaints and/or grievances on terms that are mutually acceptable to all parties. When making a complaint and/or grievance, all parties must act at all times, in good faith and should not attempt to delay and or hinder any mutually acceptable resolution.
2. In order to ensure smooth implementation of the Project and timely and effectively addressing of problems that may be encountered during implementation, a robust Grievance Redress Mechanism, which will enable to the Project Authorities to address the grievances of the stakeholders of the Project has been established.
3. All complaints and/or grievances regarding social and environmental issues can be received either orally (to the field staff), by phone, in complaints box or in writing to the UNDP, SPA or the Construction Contractor. A key part of the grievance redress mechanism is the requirement for the SPA/PMU and construction contractor to maintain a register of complaints and/or grievances received at the respective project site offices. All complainants shall be treated respectfully, politely and with sensitivity. Every possible effort should be made by the SPA/PMU and construction contractor to resolve the issues referred to in the complaint and/or grievance within their purview. However, there may be certain problems that are more complex and cannot be solved through project-level mechanisms. Such grievances will be referred to the Grievance Redress Committee. It would be responsibility of the SPA to solve these issues through a sound / robust process.
4. The Grievance Redress Mechanism has been designed to ensure that an individual and/or group are not financially impacted by the process of making a complaint and/or grievance. The Grievance Redress Mechanism will cover any reasonable costs in engaging a suitably qualified person to assist in the preparation of a legitimate complaint and/or grievance. Where a complaint and/or grievance is seen to be ineligible, the Grievance Redress Mechanism will not cover these costs.
5. Information about the Grievance Redress Mechanism and how to make a complaint and/or grievance must be placed at prominent places for the information of the key stakeholders.
6. The Safeguards officer in the PMU will be designated as the key officer in charge of the Grievance Redress Mechanism. The Terms of Reference for these positions (as amended from time to time) will have the following key responsibilities:
   1. coordinate formation of Grievance Redress Committees before the commencement of constructions to resolve issues;
   2. act as the focal point at the PMU on Grievance Redress issues and facilitate the resolution of issues within the PMU;
   3. create awareness of the Grievance Redress Mechanism amongst all the stakeholders through public awareness campaigns;
   4. assist in redress of all grievances by coordinating with the concerned parties;
   5. maintain information on grievances and redress;
   6. monitor the activities of SPA on grievances issues; and
   7. prepare the progress for monthly/quarterly reports.
7. A two tier Grievance Redress Mechanism structure has been developed to address all complaints and/or grievances in the project. The first trier redress mechanism involves the receipt of a complaint and/or grievance at the village/town and/or Markaz level. The stakeholders are informed of various points of making a complaint and/or grievance (if any) and the PMU collect the complaints and/or grievances from these points on a regular basis and record them. This is followed by coordinating with the concerned people to redress the grievances. The Safeguards Officer of the PMU will coordinate the activities at the respective District level to address the grievances and would act as the focal point in this regard. The Community Development Officer of the Local Authority or in the absence of the Community Development Officer, any officer given the responsibility of this would coordinate with the Safeguards and Gender Manager of the PMU and SPA in redressing the grievances. The designated officer of the Local Authorities is provided with sufficient training in the procedure of redress to continue such systems in future.
8. The grievance can be made orally (to the field staff), by phone, in complaints box or in writing to the UNDP, SPA or the Construction Contractor. Complainants may specifically contact the Safeguards Officer and request confidentiality if they have concerns about retaliation. In cases where confidentiality is requested (i.e. not revealing the complainant’s identity to UNDP, SPA and/or the Construction Contractor). In these cases, the Safeguards Officer will review the complaint and/or grievance, discuss it with the complainant, and determine how best to engage project executing entities while preserving confidentiality for the complainant.
9. As soon as a complaint and/or grievance is received, the Safeguards Officer would issue an acknowledgement. The Community Development Officer receiving the complaint and/or grievance should try to obtain relevant basic information regarding the grievance and the complainant and will immediately inform the Safeguards Officer in the PMU.
10. The PMU will maintain a Complaint / Grievance Redress register at the Markaz Level. Keeping records collected from relevant bodies is the responsibility of PMU.
11. After registering the complaint and/or grievance, the Safeguards Officer will study the complaint and/or grievance made in detail and forward the complaint and/or grievance to the concerned officer with specific dates for replying and redressing the same. The Safeguards Officer will hold meetings with the affected persons / complainant and then attempt to find a solution to the complaint and/or grievance received. If necessary, meetings will be held with the concerned affected persons / complainant and the concerned officer to find a solution to the problem and develop plans to redress the grievance. The deliberations of the meetings and decisions taken are recorded. All meetings in connection with the Grievance Redress Mechanism, including the meetings of the Grievance Redress Committee, must be recorded. The Safeguards Officer for the Grievances Redress Mechanism will be actively involved in all activities.
12. A Community Project Implementation Committee would be formed (from the different governorates) to oversee the first tier of the Grievance Redress Mechanism. The Community Project Implementation Committee would include:
13. Representatives of the City Councils;
14. Women representatives;
15. Youth representatives;
16. Other local organizations
17. Project Manager; and,
18. Safeguards Officer PMU.
19. The resolution at the first tier will normally be completed within 15 working days and the complaint and/or grievance will be notified of the proposed response through a disclosure form. The resolution process should comply with the requirements of the Grievance Redress Mechanism in that it should, as far as practicable, be informal with all parties acting in good faith. Further, the Grievance Redress Mechanism should, as far as practicable, achieve mutually acceptable outcomes for all parties.
20. Should the grievance be not resolved within this period to the satisfaction of the complainant, the grievance will be referred to the next level of Grievance Redress Mechanism. If the social safeguard and gender officer feels that adequate solutions can be established within the next five working days, the officer can decide on retaining the issue at the first level by informing the complainant accordingly. However, if the complainant requests for an immediate transfer to the next level, the matter must be referred to the next tier. In any case, where the issue is not addressed within 20 working days, the matter is referred to the next level.
21. Any grievance related to corruption or any unethical practice should be referred immediately to the Egypt Office of the Attorney General and the Office of Audit and Investigation within the UNDP in New York.
22. The Grievance Redress Committee formed at every sub-Markaz level would address the grievance in the second tier. A Grievance Redress Committee will be constituted for every sub-Markaz by the circulars issued by the legal representative of Local Governorate(s), who would also be the Chairman of the Committee.
23. The Structure of the committee would be:
    1. Chairman (TBA);
    2. Representative of the Coast Guards;
    3. EEAA representative;
    4. GAFRAD representative;
    5. Other national organizations; and,
    6. Project manager.
24. The Safeguard Officer from the PMU will coordinate with the respective Commissioner of Local Government in getting these Committees constituted for each Province and get the necessary circulars issued in this regard so that they can be convened whenever required.
25. The Terms of Reference for the Grievance Redress Committee are:
26. providing support to the affected persons in solving their problems;
27. prioritize grievances and resolve them at the earliest;
28. provide information to the PMU and SPA on serious cases at the earliest opportunity;
29. Coordinate with the aggrieved person/group and obtain proper and timely information on the solution worked out for his/her grievance; and
30. study the normally occurring grievances and advise PMU, National and District Steering Committee on remedial actions to avoid further occurrences.
31. The Grievance Redress Committee will hold the necessary meetings with the aggrieved party/complainant and the concerned officer and attempt to find a solution acceptable at all levels. The Grievance Redress Committee would record the minutes of the meeting.
32. Grievance Redress Committee will communicate proposed responses to the complainant formally. If the proposed response satisfies the complainant, the response will be implemented and the complaint and/or grievance closed. In cases where a proposed response is unsatisfactory to the complainant, the Grievance Redress Committee may choose to revise the proposed response to meet the complainant’s remaining concerns, or to indicate to the complainant that no other response appears feasible to the Grievance Redress Committee. The complainant may decide to take a legal or any other recourse if s/he is not satisfied with the resolutions due to the deliberations of the three tiers of the grievance redress mechanism.
33. In addition to the project-level and national grievance redress mechanisms, complainants have the option to access UNDP’s Accountability Mechanism, with both compliance and grievance functions. The Social and Environmental Compliance Unit investigates allegations that UNDP's Standards, screening procedure or other UNDP social and environmental commitments are not being implemented adequately, and that harm may result to people or the environment. The Social and Environmental Compliance Unit is housed in the Office of Audit and Investigations, and managed by a Lead Compliance Officer. A compliance review is available to any community or individual with concerns about the impacts of a UNDP programme or project. The Social and Environmental Compliance Unit is mandated to independently and impartially investigate valid requests from locally impacted people, and to report its findings and recommendations publicly.
34. The Stakeholder Response Mechanism offers locally affected people an opportunity to work with other stakeholders to resolve concerns, complaints and/or grievances about the social and environmental impacts of a UNDP project. Stakeholder Response Mechanism is intended to supplement the proactive stakeholder engagement that is required of UNDP and its Implementing Partners throughout the project cycle. Communities and individuals may request a Stakeholder Response Mechanism process when they have used standard channels for project management and quality assurance, and are not satisfied with the response (in this case the project level grievance redress mechanism). When a valid Stakeholder Response Mechanism request is submitted, UNDP focal points at country, regional and headquarters levels will work with concerned stakeholders and Implementing Partners to address and resolve the concerns. Visit [www.undp.org/secu-srm](http://www.undp.org/secu-srm) for more details. The relevant form is attached at the end of the ESMF.

# Key Environmental and Social Indicators

1. This section identifies the key environmental and social indicators identified for the project and outlines respective management objectives, potential impacts, control activities and the environmental performance criteria against which these indicators will be judged (i.e. audited).
2. This section further addresses the need for monitoring and reporting of environmental performance with the aim of communicating the success and failures of control procedures, distinguish issues that require rectification and identify measures that will allow continuous improvement in the processes by which the projects are managed.

## Climate

1. Egypt is generally characterized by a semi-desert climate, with hot dry summers, moderate winters, and very little rainfall. The Mediterranean coasts have stronger winds with an annual average wind speed of about 6.0-6.5 m/sec (Agrawala et al., 2004). Cumulative data of the Northern coastal climate of Egypt was obtained in order to make comparisons between the targeted sites.
2. As presented below, temperature shows a rather consistent pattern along the coastline, similar to rainfall, with the exception of Port Said, which has the lowest rainfall volumes. Prevailing North West wind direction is also rather consistent along the coastline. The prevailing wind setup, almost perpendicular to four of the hotspots, will help develop artificial sand dunes, via sand trapped in the soft structures to be established. The remaining hotspot “Beheira” has a, more or less, parallel orientation to the prevailing wind direction, which would not naturally induce the development of sand dune and accordingly, this specific hotspot will utilize rock protection. Oceanographic data also shows a rather consistent pattern along the shoreline.
3. **Air Temperature:** Temperature data was obtained from the Seawind II temperature database through the period 1989-2015. The database consists of monthly data of air temperature with a spatial resolution of 0.125° for the whole Northern Egyptian coast (Donlon et al., 2012). The mean monthly data is presented in Table 6, Figure 5, Figure 6 and Figure 7.
4. Air Temperatures are, more or less, similar along the five hotspots with insignificant variations, reflecting a similar dominant climate along the Egyptian Mediterranean coast.

Table 6: Mean monthly Air Temperature for the hot-spots

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Beheira | Kafr El Sheikh | Dakahlia | Damietta | Port Said |
| Mean | 15° C | 15° C | 15.5 | 15 °C | 15°C |
| Maximum | 19 ° C | 19° C | 18°C | 18.5°C | 19° C |
| Minimum | 11° C | 11° C | 11.5 | 11°C | 11° C |

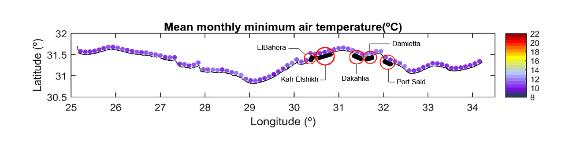


Figure 5: Mean value of the monthly minimum air temperature (°C) for the period 1989-2015

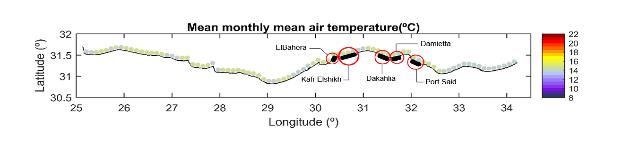


Figure 6: Mean value of the monthly mean air temperature (°C) for the period 1989-2015

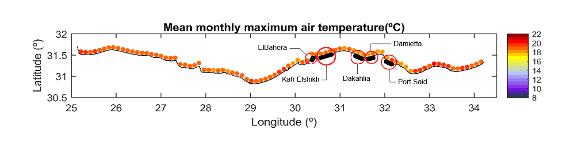


Figure 7: Mean value of the monthly maximum air temperature (°C) for the period 1989-2015

1. **Precipitation:** The annual and seasonal Precipitation was measured by Sea Wind II data base for the period 1989-2015, (Spatial resolution 0.125°). The rainfall is almost the same in all sites, except for Port Said which had the lowest rate of annual rainfall, while Beheira had the highest rate of rate rainfall in comparison to the rest of the sites. Nonetheless, during the dry season the rainfall is almost negligible in all sites, as presented in Table 7, Figure 8, Figure 9 and Figure 10.

Table 7: Annual mean precipitation at the hot-spots

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Beheira | Kafr El Sheikh | Dakahlia | Damietta | Port Said |
| Annual mean | 330mm | 300mm | 280mm | 320mm | 125mm |
| Wet season (monthly mean) | 53mm | 41.6mm | 50mm | 50mm | 18mm |
| Dry season (monthly mean) | 2mm | 2mm | 2mm | 2mm | 2mm |

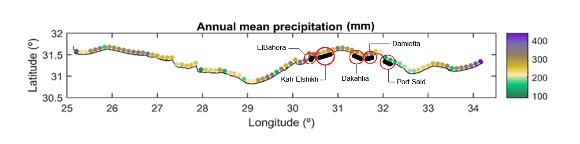


Figure 8: Mean value of the annual precipitation (mm) for the period 1989‐2015

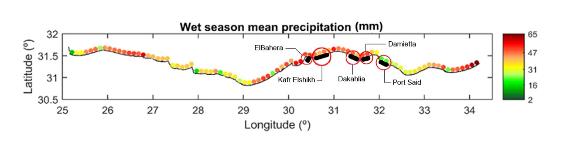


Figure 9: Monthly mean value of precipitation (mm) during wet season (October to March) for the period 1989‐ 2015

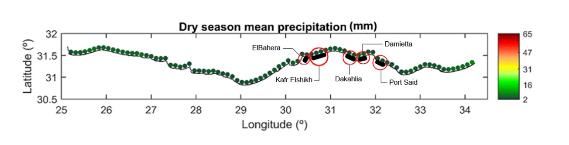


Figure 10: Monthly mean value of precipitation (mm) during dry season (April to September) for the period 1989‐2015

1. **Wind:** The annual data from 2009 to 2017, obtained from windfinder database, is represented in Table 8 covering wind speed and direction. The data was acquired from the three closest meteorological stations to the five project hotspot locations.
2. The prevailing wind direction is North West (NW), with an average Wind speed of (8, 5, 9) Knots in Alexandria, Baltim and Port Said respectively, while the prevailing wind direction in Port Said shifts toward the North (NNW), as presented in Table 8, Figure 11, Figure 12 and Figure 13.

Table 8: Mean wind data from three stations

|  |  |  |  |
| --- | --- | --- | --- |
| **Measurements** | **Stations** | | |
| Alexandria | Baltim | Port Said |
| Wind speed (Kts) | 8 | 5 | 9 |
| Wind direction | NW | WNW,NNW | NNW |
| N= North W= West | | | |

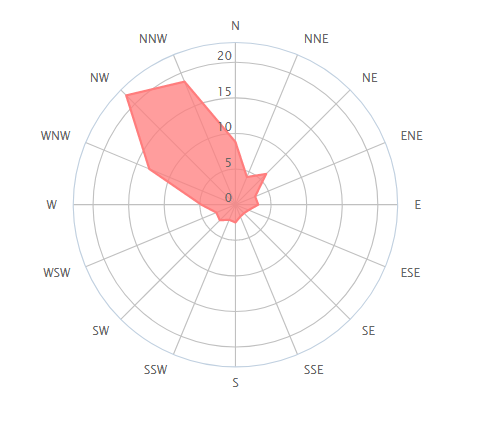


Figure 11: Alexandria station windrose (annual)

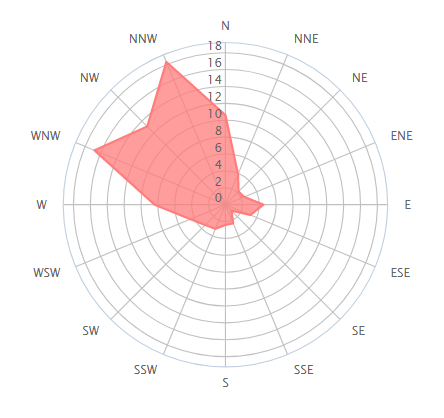


Figure 12: Baltim station windrose (annual)

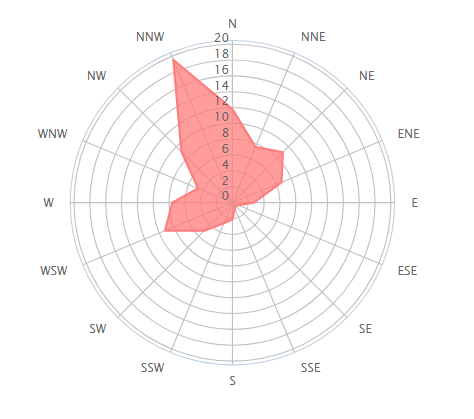


Figure 13: Port Said station windrose (annual)

1. **Sea Surface Temperature**: The Sea Surface Temperature was measured during the entire Period 1985-2015, (Robert‐Jones et al., 2012) (Spatial resolution 0.05°). The sea water temperature in the five hot spots is the same as described in Table 9, Figure 14, Figure 15 and Figure 16. The sea surface Temperature showed insignificant variation along the hotspots, reflecting a similar dominant climate along the Egyptian Mediterranean coast.

Table 9: Mean sea surface temperature of the hot-spots

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Beheira | Kafr El Sheikh | Dakahlia | Damietta | Port Said |
| Mean | 21.5 ° C | 21.5 ° C | 21.5 ° C | 21.5 ° C | 21.5 ° C |
| Maximum | 28° C | 28° C | 28° C | 28° C | 28° C |
| Minimum | 15° C | 15° C | 15° C | 15° C | 15° C |

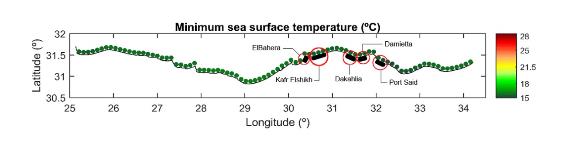


Figure 14: Minimum value of the sea surface temperature (°C) for the period 1985‐2015

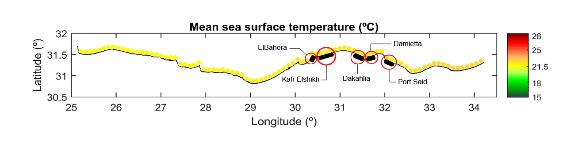


Figure 15: Mean value of the sea surface temperature (°C) for the period 1985‐2015

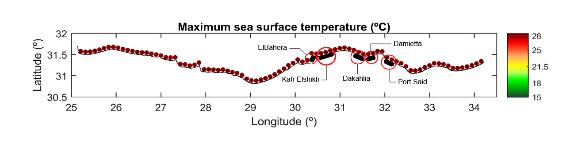


Figure 16: Maximum value of the sea surface temperature (°C) for the period 1985‐2015

1. **Significant wave height**: The hourly mean significant wave height was measured by “Global Ocean Waves” (GOW) database for the period 1979-2015, (Reguero et al., 2012) (Spatial resolution 0.125°) with Beheira having the highest wave height as presented in Table 10, Figure 17 and Figure 18. Significant wave height showed highest values in Beheira, while the lowest values were in Dakahlia.

Table 10: Mean significant wave height of the hot-spots

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Beheira | Kafr El Sheikh | Dakahlia | Damietta | Port Said |
| Mean | 0.9-1 m | 0.87 m | 0.75m | 0.8 m | 0.75-0.8 m |
| Maximum | 6.5 m | 4.75 m | 4.5m | 5 m | 4.5 m |

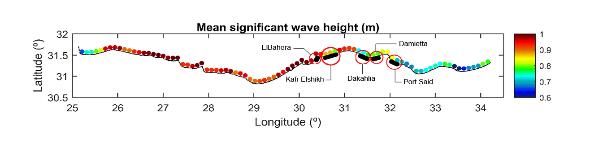


Figure 17: Mean value of the hourly mean significant wave height (m) for the period 1979-2015

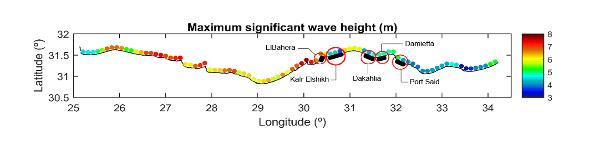


Figure 18: Maximum value of the hourly mean significant wave height (m) for the period 1979-2015

1. **Wave Energy Flux:** The mean Wave Energy Flux during the entire Period 1979-2015, (Reguero et al., 2012) (Spatial resolution 0.125°) with Beheira having the highest wave flux is represented in Table 11**.** and Figure 19. The wave energy flux showed highest values in Beheira, while it was lowest in Dakahlia.

Table 11: Mean wave energy flux of the hot-spots

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Beheira | Kafr El Sheikh | Dakahlia | Damietta | Port Said |
| Mean | 0.3 kW/m | 0.197 kW/m | 0.17 kW/m | 0.2 kW/m | 0.19 kW/m |

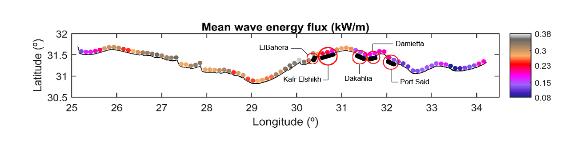


Figure 19: Mean value of the wave energy flux (kW/m) for the period 1979-2015

1. **Climate impacts**: The rate of sea level for the Nile Delta ranges between 3.2 - 6.6 mm per year and is due to two major factors - globally rising sea due to thermal ocean expansion and deglaciation and locally sinking land due to compaction of sediments and loss of annual replenishment of sediments. The IPCC concludes that global mean sea levels have risen between 2.8 and 3.6 mm per year over the period 1993 to 2010. During that same period, local land subsidence has been evident across the entire Delta, with actual rates ranging from about 0.4 mm/year in Alexandria to the west to around 3.0 mm/year in Port Said to the east (El-Shinnawy, 2008).
2. Moreover, coastal areas in the Nile Delta will be vulnerable to an increasing frequency and intensity of extreme coastal storms. As with many climate change modeling outcome, projected regional changes in storm frequency are still uncertain and there is no consensus reported by the IPCC in this respect; regional projections at the spatial scale of the Nile Delta are even more difficult as they need to account for both storm intensity and changes in storm tracks(Marcos et al., 2011). Nevertheless, the southern Mediterranean has already seen a measurable increase in the number of natural disasters: from an average of three natural disasters per year in 1980, the region experienced a steady increase to an average of more than 15 per year in 2006 (El-Shinnawy et al., 2008). An increase in frequency and severity of storm surges is already evident over the past seven years with three extreme storms most commonly associated with 1-in-50 year storm events. The continuation of rising seas, sinking lands, and more frequent and intense storms is a necessary inference from the review of recent trends and future climate change forecasts.
3. Economic damages from climate change induced sea-level rise on the North Coast of Egypt will be direct and far-reaching. Today, much of Egypt’s population, industry, agriculture, private sector and tourism infrastructure and development along the northern low coastal lands and the reliance on the Nile delta for prime agricultural land. Studies on the vulnerability of Alexandria indicated that sea level rise of 0.3 meters would lead to infrastructure damage worth billions of dollars, displacement of over half a million inhabitants, and a loss of about 70,000 jobs (Firhy et al., 1997, El-Raey et al., 1999, El-Raey, 2004).

## Ecology

### Background

1. From a bio-geographical perspective, the northern Nile Delta represents a unique meeting point for biological elements from three bio-geographical regions: the Mediterranean (extending along the coastal zone), the Saharo-Sindian (relicts isolated in the sand dunes) and the Afro‐tropical (extending northwards along the Nile Valley) (Environics, 2016).
2. The study areas are located in the middle and eastern part of the Mediterranean coast of the Nile Delta. The Deltaic coastal part includes some of the few remaining fragments of wilderness. While at the eastern part; sparse vegetation is found in Port Said area, and very little flora and fauna exist at Damietta area due to extensive urbanization and industrial activities The common habitats between the hotspots are presented in the following table:

Table 12: Natural habitats of the five hotspots

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Natural Habitats** | **Hot-spots** | | | | |
| Beheira | Kafr El Sheikh | Dakahlia | Damietta | Port Said |
| Sandy beaches |  |  |  |  |  |
| Sand dunes |  |  |  |  |  |
| Salt Marshes |  |  |  |  |  |
| Sabkha |  |  |  |  |  |

1. Some parts of the coast include man-made habitat such as: Factories, resorts and urban settlements.
2. The following sections present a description of the ecological characteristics of the wider area in relation to the five hotspot sites.

#### Terrestrial Ecology

1. The coastal belt consists primarily of sandy beaches, sometimes lined by Sabkha, saltmarshes and sand dunes with a sparse vegetation cover composed mostly of coastal, obligate and halophytic shrubs. The latter are mostly found in sand hammocks scattered on the backshore sabkha flats. This shrub-vegetation-cover traps wind‐drifting sands and acts as a barrier. According to Zahran et al. (1990), among the most prominent plant communities in the Deltaic and Eastern Mediterranean coast:

* *Zygophyllum aegyptium, Inula crithmoides, Arthrocnemum macrostachyum, Juncus acutu s* found in salt marshes and sand formation and *Halocnemum strobilaceum*, in salt marshes.
* *Elymus fractus, Alhagi graecorum, Cynodon dactylon, Heliotropium curassavicum, Thymelaea hirsute, Aspargus stipularis* and *Pancratium maritimum*, in sand dunes.
* *Cressa cretica and Phragmites australis* in sand flats.
* *Tamarix nilotica* is also common in sand formations.
  + Possible mammal species include; The common rodent species in the coastal area include; Fat sand Rat (*Psammomys obesus*) which is locally endangered according to IUCN regional criteria, the Norway Rat (*Rattus norvegicus*) and the House Mouse (*Mus musculus*).
  + The Anderson’s Gerbil (Gerbillus andersoni) is a known to occur at coastal plains and sand dunes (Granjon, 2016), which is considered as vulnerable species in Egypt.
  + The carnivores Red Fox (Vulpes vulpes).
  + The endemic Pale Gerbil (Gerbillus perpallidus) a known species from the coastal belt and mainly recorded at el Beheira region.

1. The North Delta coast is an important migratory and breeding area for birds, particularly during the autumn migration season. The Prominent seabirds include Gull species such as: Black‐headed Gull (*Larus ridibundus*), Yellow‐legged Gull (*Larus cachinnans*) and Audouin’s Gull (*Larus audouinii*) which is an endemic seabird to the Mediterranean Basin and the Lesser Crested Tern (*Sterna bengalensis*) (Tharwat, 1997).The Little Tern (*Sterna albifrons*) and Kentish Plover (*Charadrius alexandrinus*) are known to breed in coastal area but are more likely to be found closer to the shore. The Spur‐winged Lapwing (*Vanellus spinosus*) and White Wagtail (*Motacilla alba*) are common and frequently encountered in the backshore area (Environics, 2016).
2. Among the common reptiles in the Deltaic and Eastern Mediterranean coast:
   * Bosc’s lizard (Acanthodactylus boskianus) is a common species in coastal areas
   * Montpellier Snake (Malpolon monspessalanus) is found in sandy areas of the northern Delta around vegetated saltmarshes and in cultivated lands (Saleh, 1997)
   * The Desert Monitor (Varanus griseus) which is a nearly threatened species was recorded for the first time in sand dunes near the Beheira site. It could also be found at coastal salt marshes.,

#### Marine Ecology

1. Sarwat (1999) observed two endangered sea turtle species, the Loggerhead (*Caretta caretta*) and the Green Turtle (*Chelonia mydas*) with both being expected to be present in coastal waters, but far from the reach of any potential impacts. Moreover, previous interviews with fish vendors at the Alexandria Fish Market revealed that many marine turtles are caught (illegally).
2. Marine fish in the wider area include *Pagellus erythrimis, Siganus rivulatus, Liza ramada, Alepes djedaba, Temnodon sultator, Pagellus mormyrus, Pagrus pagrus, Sphyraena chrysotaenia, Trigla lastoviza, Marone labrax, Merluccius merluccius, Sardinella aurita* and *Saurida undosquamis* (Al Amar, 2015)
3. European Squid (*Loligo vulgaris*), Common Octopus (*Octopus vulgaris*) and cuttlefish (*Sepia officinalis, Sepia pharaoni and Sepia prashadi*) are all caught offshore of Ras El Barr (ERM/Environics 2015).
4. The Deltaic Mediterranean coast scavenging species such as the Angular Crab (*Goneplax rhomboids*) and the Green Crab (*Carcinus mediterraneus*) are reported common along the foreshore of the Deltaic Mediterranean Coast (Egyptian LNG, 2002).
5. Other recorded communities are Copepods, Ostracoda, Protozoa, Appendicularia, Cnidaria, Polychaeta, Molluscs and Chaetognatha (Environics, 2015).
6. Sea grass meadows were not observed during previous surveys (NIOF, 2009; ERM/Environics 2015; Al Amar, 2015).
7. According the past surveys many diatom species and dinoflagellate were recorded such as *Skeletonema costatum, Chaetoceros ruvisetus, Chaetoceros affinis, Chaetoceros sociales, Chaetoceros curvisetus* and *Ceratium falcatum* (Al Amar, 2015)*.*
8. **Introduced species**: The Norway Rat (*R. norvegicus*) was introduced to Egypt from south-east Siberia, north-east China and parts of Japan.
9. It is now known that more than 300 invertebrate species (Ahyong and Galil, 2006) and 55 indo-pacific fish species have succeeded in crossing the Suez Canal from the Red Sea and establishing themselves in the east Mediterranean Sea where the salinity and temperature conditions are nearest to their original environment, Known as (Lessepsian Migration) (Edelist el al. 2013) (ENVIRONICS, 2015).

### Performance Criteria

1. The following performance criteria are set for the construction of the projects:
2. locations will be surveyed for sensitive or critical habitats prior to the works;
3. no clearance of vegetation outside of the designated clearing boundaries;
4. no death to native fauna as a result of clearing activities;
5. no deleterious impacts on aquatic environments and terrestrial habitats;
6. no introduction of new weed species as a result of construction activities ; and
7. no increase in existing weed proliferation within or outside of any project footprint as a result of construction activities.
8. in dewatering activities, suction shall be from surface to minimize marine sedimentation at the discharge locations. Marine discharge locations will be selected to avoid marine-sensitive and/or shallow areas through carrying out limited marine surveys.
9. fill material from “other” locations will be chemically and biologically analysed to minimize introduction of alien species.
10. A flora and fauna management program will be implemented (Table 13).

### Monitoring

1. Weed monitoring will be undertaken and appropriate action taken in the event of alien or noxious species being identified.
2. Seasonal checks of critical habitats (sabkha flats, sand dunes and salt marshes), if identified in the pre-construction survey, will be conducted for comparison with baseline conditions.
3. Seasonal monitoring of existing surrounding flora and fauna (birds, reptiles, mammals and marine life) for identification of any trends that may be related to introduction of the project structures.
4. The delivery organisation will, when undertaking works, compile a weekly report to the steering committee outlining:
5. any non-conformances to this ESMF;
6. the areas that have been rehabilitated during the preceding week; and
7. details of the corrective action undertaken.

### Reporting

1. All flora and fauna monitoring results and/or incidents will be tabulated and reported as outlined in the ESMF. The SPA must be notified in the event of any suspected instances of death to native fauna and where vegetation if detrimentally impacted.

Table 13 Flora and Fauna Management Measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control Activity (and Source)** | **Action Timing** | **Responsibility** | **Frequency** |
| FF1. Habitat loss and disturbance of Flora and Fauna | FF1.1 Survey the five locations for critical habitats  FF1.2 Limit vegetation clearing and minimise habitat disturbance through adequate protection and management of retained vegetation. | Pre-construction  During construction | SPA  SPA | Once, prior to construction  Daily and maintain records |
| FF1.3: Minimise noise levels and lighting intrusion throughout construction and operation in the vicinity of any sensitive locations. | During construction | SPA | Daily and maintain records |
| FF1.4: Ensure that all site personnel are made aware of sensitive fauna/habitat areas and the requirements for the protection of these areas. | During construction | SPA | Daily and maintain records |
| FF1.5 Minimise disturbance to on-site fauna and recover and rescue any injured or orphaned fauna during construction and operation.  FF1.6 Planning of dewatering activities to minimize impacts to marine receptor locations; minimize suction of sediments and select discharge locations based on survey.  FF1.7 Checks of critical habitats (sabkha flats, sand dunes and salt marshes), if identified in the pre-construction survey.  FF1.8 Monitoring of existing surrounding flora and fauna (birds, reptiles, mammals and marine life) for identification of any trends that may be related to introduction of the project structures. | During construction  During construction  During Operation  During Operation | SPA  SPA  SPA  SPA | Daily and maintain records, report  Prior to dewatering activities  Seasonal  Seasonal |
|
| F2. Introduced flora and weed species | FF2.1: Revegetate disturbed areas using native and locally endemic species that have high habitat value. | During construction | SPA | As required and maintain records |
| FF2.2: Seed is to be weed free  FF2.3 Biological analysis of fill material  FF2.4 Visual observation of alien species and manual removal and disposal, if found. | Operation  During construction  Operation | SPA  SPA  SPA | Maintain records  Prior to any fill activities  Monthly |

## Groundwater

1. The water sources in Egypt are presented in Figure 20. Fossil groundwater is hosted in deep aquifers as non-renewable water resources. Fossil water exploitation is estimated at a rate of 1.65 Billion m3 /yr mainly concentrated at the oases of the Western Desert. Groundwater in the Nile aquifer system and desert fringes is not a resource in itself as it is replenished from the river Nile by seepage from canals and deep percolation from irrigation application. The annual groundwater abstraction in the Nile aquifer system and fringes is about 4.6billion m3. Another 0.5 billion m3 is abstracted from the desert aquifers and the coastal areas.
2. **Aquifers in Egypt can be divided as follows[[7]](#footnote-7):**
3. Aquifers of Nile River Basin and Delta: Considered one of the renewable aquifers as it draws its water from leakages of Nile River, canals network and irrigation water; this resource is used to provide cities and villages with clean drinking water after purification, because of its low treatment costs.
4. Aquifers of Western Desert (Nubian Sandstone Aquifers): One of the non-renewable aquifers, estimated at 200000 billion cubic meters. Due to the depth of this aquifer, extraction is very costly and only little amounts of this water is utilized. The Nubian Sandstone Aquifer is considered the largest groundwater reservoirs in the world, and both of Sudan, Libya and part of Chad share this huge aquifer with Egypt.
5. Aquifers of the Eastern Desert and Red Sea coast: Considered a non-renewable aquifer because it is fed by winter’s rainfall, the possibility of water extraction is very low due to its existence at far depth, with high cost of extraction.
6. Aquifers of the Sinai Peninsula: There are three ground aquifers in Sinai Peninsula:

• Shallow aquifer located in North Sinai

• Average depth aquifer located in valley’s area at central of Sinai

• Far deep aquifer.

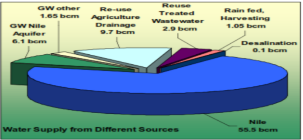


Figure 20: Water Resources in Egypt

1. According to The Research Institute for Groundwater (RIGW) in 1992; the five project hotspots are located at a generally moderately productive quaternary aquifer with a depth between 0-5m as presented in Figure 21. Mean extraction rates are less than 1 mm/year, due to its high salinity as presented in Figure 22.

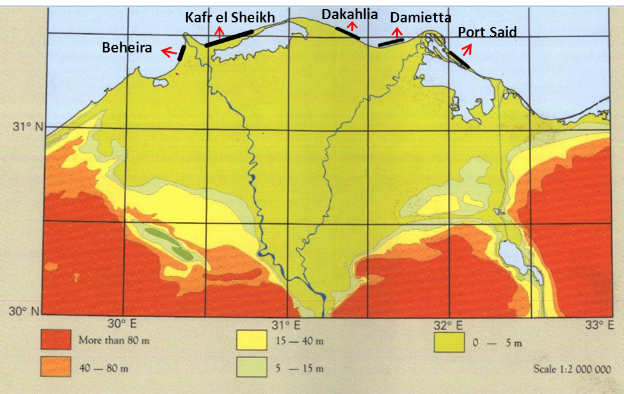
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Figure 21: Groundwater depth in Egypt

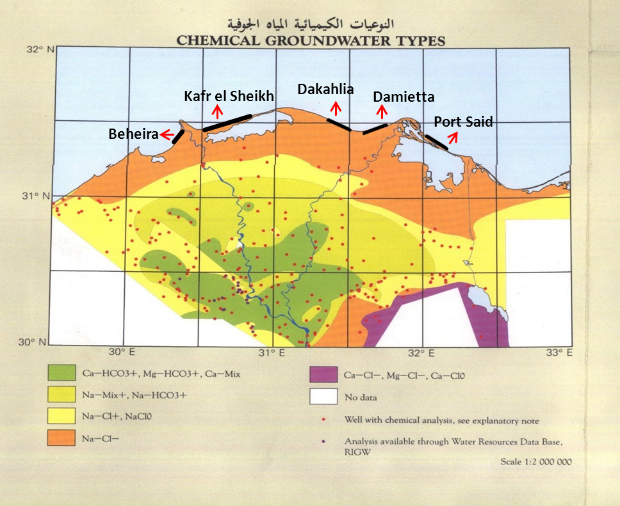
****

Figure 22: Groundwater salinity

### 5.3.1 Performance Criteria

1. The following performance criteria are set for the project:
2. no significant decrease in the quality and quantity of groundwater is expected as a result of construction and operational activities in proximity to the projects;
3. effective implementation of site-specific EDSCPs and other measures to protect groundwater.
4. Development and implementation of a waste management plan that covers collection, storage and disposal.
5. Development of spill response procedure, kits and training on site.
6. Development of equipment refuelling procedure.
7. Secondary containment of fuel storage tanks.
8. Proper selection of geotextile material suitable for seawater; i.e. propylene geotextile is more tolerable to pH variations
9. Analysis of dredged material for chemical contamination.
10. Chemical and biological analysis of water used for compaction. Preferable to use seawater.
11. By following the management measures set out in the ESMF the project will not have a significant impact on groundwater quality across the broader area.

### Monitoring

1. Groundwater quality should be assessed initially and then at least every six months. Initial assessment should cover a wide range of parameters (eg depth to water, pH, DO, conductivity, nitrates, phosphates, faecal coliforms, heavy metals, turbidity, hydrocarbons) to provide a baseline and to confirm suitability for intended use. Subsequent monitoring parameters will be determined on need.
2. Chemical and biological analysis of water used for compaction and for dust suppression. It is preferable to use seawater for this purpose to match the salty nature of the area. The land-sea relation and transfer of properties is a result of tides and storm water surge.
3. Chemical analysis of the dredged material, to be used as a fill, will be conducted with a specific schedule before being transported to the site, in order to decide if material is suitable to be used or rejected.

### Reporting

1. All water quality monitoring results and/or incidents will be tabulated and reported as outlined in the ESMF. The SPA must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to water quality is exceeded.

Table 14 Groundwater management measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| GW 1: Increase of gross pollutants, hydrocarbons, metals and other chemical pollutants into the groundwater environment. | GW1.1: Conduct regular groundwater quality monitoring in locations where the groundwater is likely to be impacted. | Construction and operation phase | SPA | Every six months and as required, with reporting to SPA and UNDP |
|
| GW1.2: Designated areas for storage of fuels, oils, chemicals or other hazardous liquids should have compacted impermeable bases and be surrounded by a bund to contain any spillage. Refuelling to be undertaken in areas away from water systems. | Entire construction and operation phase | SPA | Weekly with reporting to WHO and UNDP |
|
| GW1.3: Check all vehicles, equipment (pumps, generators, etc.) and material storage areas daily for possible fuel, oil and chemical leaks. Undertake refuelling at designated places away from water systems. | All phases | All Personnel | Daily and maintain records |
|
| GW1.4 Chemical analysis of dredged material | Construction phase | SPA | Every utilized batch of dredging fill material |
| GW1.5 Chemical and biological analysis of water used for compaction. Preferable to use seawater. | Construction phase | SPA | Monthly |
|

## Marine Water Quality

### Background

1. The five hotspot project locations lie within the setback distance (up to 200m) from the Mediterranean coastline. However, the locations include no rivers or lakes, where the closest is El-Gameel located to the east of the Port Said hotspot outside its boundaries. The Rosetta branch is located at 2.3 km at the eastern side of the Beheira site.
2. The project activities have no direct contact with seawater except for dewatering activities expected at the Kafr El Sheikh, Port Said and Damietta locations. Water will potentially be sucked out of the excavations and discharged to the sea. The discharged water is expected to have very similar quality to the seawater based on the proximity of the locations to the coastline.
3. There is an indirect connection between the groundwater at the five locations with the sea, where contamination of soil/groundwater could potentially pollute the seawater and impact its quality. However, measures have already been identified in the “groundwater” section above to mitigate this impact.
4. According to the Egyptian Environmental Affairs Agency (EEAA) (2015a) annual report;

* The PH ranges between 8.18 – 7.86 along the coastline, which indicate that the water is closer to basic levels.
* Salinity ranges between 34 – 37 g/L, showing lowest concentrations in Port Said and Beheira hot-spots due to the presence of drains close to their boundaries.
* The Water Transparency is relatively low due to sediment transport from the freshwater outlets.
* Biological Oxygen Demand (BOD) was recorded to be the highest in the delta region relative to the rest of the Egyptian Mediterranean coast, while the overall Egyptian Mediterranean coast mean figure was 6.9 mg/L.
* The mean Chemical Oxygen Demand (COD) recorded level is 10.1 mg/L along the Egyptian Mediterranean coast. The highest values were recorded near Alexandria.
* The concentration of Ammonia and Nitrate were highest in Port Said (0.016 mg/L), (0.06 mg/L), while the lowest concentrations were recorded in Kafr El Sheikh with (0.09 mg/L), (0.03 mg/L) respectively.
* The concentration of total Phosphates was highest in Port Said (0.065 mg/L), while it was the lowest in Kafr El Sheikh (0.03 mg/L).

### Performance Criteria

1. The following performance criteria are set for the construction of the projects:
2. no significant decrease in water quality as a result of construction and operational activities;
3. effective implementation of site-specific Erosion, Drainage and Sediment Control Plan EDSCPs.
4. During dewatering activities (for construction purposes only); suction shall be from the surface to minimize re-suspension of sediments. Discharge locations shall be selected to avoid marine-sensitive and/or shallow areas through carrying out limited marine surveys.
5. Dredged materials from lakes, to be used as a fill material, will be acquired after it has been dewatered at its original location.

### Monitoring

1. Seawater samples will be collected from the discharge locations for analysis of turbidity and suspended sediments. A sampling and analysis program will be prepared prior to the construction activities.

### Reporting

1. All water quality monitoring results and/or incidents will be tabulated and reported as outlined in the ESMF. The SPA must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to water quality is exceeded.

Table 15 Water Quality Management Measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| W1: Elevated suspended solids and other contaminants in surface water systems. | W1.1: Develop and implement a site specific Erosion, Drainage and Sediment Control Plan (EDSCP) to address drainage control, sediment and erosion controls and stockpiling of materials including soil during construction of all components of the projects. EDSCP measures to be inspected regularly to ensure all devices are functioning effectively. | Pre Earthworks | SPA | Initial set up and then as required with reporting to SPA and UNDP |
|

## Surface Water

### Background

1. The specific project activities have no direct connection with surface water. The closest water body to the 5 hot spots is the Mediterranean Sea. Other water bodies near the study areas boundaries include; discharge water; and, northern lakes:
2. **Canals/Drains**

* Ashtum El Gamel outlet (Bughaz) located to the east of the Port Said hotspot outside its boundaries.
* Nile River: Discharges to the Mediterranean Sea via the Rosetta branch, located 2.3 km away the eastern side of the Beheira site.
* Damietta Branch: Discharges to the Mediterranean through the Navigational canal in Damietta port, located 4.5 km away from the eastern side of Damietta site.
* Pumping station at the west boundaries of the Dakahlia site, which discharges the el Salam Canal into the Mediterranean.

1. **Northern Lakes**
2. Lake Manzala: Located south of Port Said Site, outside its boundaries. It is considered as the largest of Egyptian wetlands and the most productive for fisheries, and most important Egyptian wetland for wintering water birds. According to the annual report from the EEAA (2015b), the water quality within the lake had a pH of 8.37, dissolved oxygen was 5.40 mg/l, except for two locations (Bahr El Bakr drain and W Elbashter), where DO levels were: 1.38.
3. The Mean Biological Oxygen Demand value was 36.63 mg/L, while the Chemical Oxygen Demand was 46.38 mg/L in El Gamel Boughaz, with an average of 128.56 mg/L for the whole lake.
4. Lake Burullus: Located south of Kafr El Sheikh Site outside its boundaries. It is considered as one of Egypt’s most important wetlands for wintering waterfowls, also important Plant Area (IPA) according to plant life international. According to the annual report from the EEAA (2015c); the pH was 8.56, Dissolved Oxygen was 7.67 mg/L, while the value was as low as 0.9 mg/L at Hoksa Drain
5. The Biological Oxygen Demand (mean value) was 24.29 mg/L, while Chemical Oxygen Demand (mean value) was 89.78 mg/L.

### Performance Criteria, Monitoring and Reporting

1. In absence of direct or indirect connection between the project activities and the northern lakes and/or discharge drains, no performance criteria are required. As the spoil dewatering activities is out of scope of the current study (i.e. the dredged material to be used as a fill will already be dried at its originating location)

## Air Quality

### Background

1. All construction activities have the potential to cause air quality impacts.
2. The specific project areas are predominantly unoccupied, with some recreational and fishing uses. The areas south of the project locations include the coastal highway, farms, fish farms, industrial and residential areas. These are more described in the “socio-economic” section below.
3. Existing air quality reflects those environments, with dust being the main air quality concern.
4. Workers involved in construction and operation activities should be familiar with methods for minimising the impacts of deleterious air quality and alternative construction procedures.
5. As part of the national ambient air quality monitoring program conducted by EEAA, there are 87 stations currently affiliated to the National Network for Monitoring Air Pollutants in Egypt. The nearest stations to the project hotspots have been identified as presented in Figure 23.

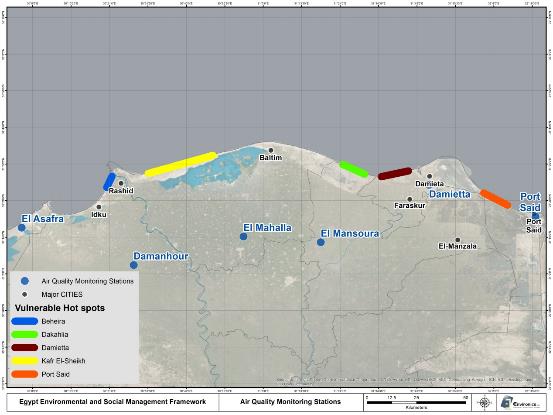


Figure 23: The nearest air quality monitoring stations for the project's sites

1. The air quality information for these stations was extracted from the monthly reports for Air quality monitoring of Egypt for year 2015. Table 16, Table 17 and Table 18 illustrate the monthly average for air pollutant concentrations of Sulphur Dioxide SO2, Nitrogen Dioxide NO2 and Particulate Matter PM10 which are measured in μg/m3.
2. As presented in the tables, the recorded values of SO2 are well below the law limits (when compared with the SO2 one year limit of 50 and 60 μg/m3 for urban and rural areas, respectively). However, Damanhour measured high levels during the month of May (no specific reason mentioned in the EEAA report). The same trend applies to the NO2 levels, with high levels recorded during few months in Mansoura. PM10 recorded values exceeded these limits in some months, especially in El Mahalla and El Mansoura.

Table 16: Monthly Average SO2 Concentrations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Month** | **SO2 (μg/m3) (Law** | | | | |
| **Damietta** | **Port Said** | **El Mansoura** | **Alexandria**  **(El Asafra)** | **Damanhour** |
| January | 13 | 26 | 20 | 1 | 8 |
| February | 10 | 5 | 12 | 2 | 7 |
| March | 12 | 10 | 22 | 2 | 5 |
| April | 33 | 6 | 21 | 2 | 6 |
| May | 6 | 10 | 35 | 7 | 153 |
| June | 13 | 8 | 24 | 3 | 8 |
| July | 9 | 9 | 22 | 1 | 6 |
| August | 13 | \_\_ | 26 | \_\_ | \_\_ |
| September | 13 | 6 | \_\_ | 1 | 11 |
| October | \_\_ | 4 | 7 | 2 | 9 |
| November | 15 | 5 | 6 | 1 | 43 |
| December | 16 | 7 | 10 | 2 | 7 |

Source: Monthly Air Quality Report in Egypt for the year 2015, EEAA

Table 17: Monthly Average NO2 Concentrations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Month** | **NO2 (μg/m3)** | | | | |
| **Damietta** | **Port Said** | **El Mansoura** | **Alexandria**  **(El Asafra)** | **Damanhour** |
| January | 18 | 18 | 74 | 20 | 21 |
| February | 18 | 2 | 68 | 58 | 8 |
| March | 20 | \_\_ | 48 |  | 6 |
| April | 36 | 20 | 42 | 4 | 6 |
| May | 14 | 3 | 41 | 62 | 27 |
| June | 67 | 13 | 30 | 11 | 2 |
| July | 63 | 5 | 22 | 5 | 2 |
| August | 63 | \_\_ | \_\_ | \_\_ | \_\_ |
| September | 67 | 10 | 30 | 41 | 23 |
| October | \_\_ | 9 | 39 | 24 | 16 |
| November | \_\_ | 36 | 34 | 2 | 47 |
| December | 25 | 11 | \_\_ | 5 | 38 |

Source: Monthly Air Quality Report in Egypt for the year 2015, EEAA

Table 18: Monthly Average PM10 Concentrations

|  |  |  |  |
| --- | --- | --- | --- |
| **Month** | PM10 (μg/m3) | | |
| Damietta | El Mansoura | El Mahalla |
| January | 32 | 180 | 220 |
| February | 80 | 187 | 310 |
| March | 115 | 97 | \_\_ |
| April | 97 | 102 | \_\_ |
| May | 99 | 98 | 148 |
| June | 82 | 69 | 134 |
| July | 76 | 66 | 121 |
| August | \_\_ | 80 | 143 |
| September | 88 | 87 | 162 |
| October | \_\_ | 95 | 175 |
| November | 129 | 116 | 204 |
| December | 111 | 77 | 172 |

Source: Monthly Air Quality Report in Egypt for the year 2015, EEAA

### Performance Criteria

1. The following performance criteria are set for the construction of the projects:
2. Corrective action to respond to complaints and/or grievances is to occur within 48 hours.
3. Inspect and approve efficient equipment only.
4. Minimize equipment movements through proper planning of activities.
5. Apply dust suppression.
6. Apply vehicle speed limit, particularly on unpaved roads.

### Monitoring

1. A standardised air monitoring program has been developed for the projects.
2. The requirement for dust suppression will be visually observed by site personnel daily and by SPA and UNDP staff when undertaking routine site inspections;
3. Vehicles and machinery emissions – visual monitoring, measurements to be carried out when deemed excessive.

### Reporting

All air quality monitoring results and/or incidents will be tabulated and reported as outlined in the ESMF. The SPA must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to air quality is exceeded.

Table 19 Air Quality Management Measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| A.1 Increase in dust levels at sensitive receptors | A1.1: Implement effective dust management measures in all areas during design, construction and operation. | Pre and during construction | SPA | Daily and maintain records |
| A1.2: Restrict Speed on roads and access tracks | During Construction | SPA | Daily and maintain records |
| A1.3: Manage dust /particulate matter generating activities to ensure that emissions do not cause an environmental concern at sensitive receptors. | During Construction | SPA | Daily and maintain records |
| A1.4: Construction activities should minimise risks associated with climatic events (check forecasts). | During construction | SPA | Daily and maintain records |
| A1.5: Implement scheduling/staging of proposed works to ensure major vegetation disturbance and earthworks are minimised. | During construction | SPA | Daily and maintain records |
| A1.6: Locate material stockpile areas and Rubbish as far as practicable from sensitive receptors. Cover if appropriate. | During construction | SPA | Daily and maintain records |
| A1.7: Source sufficient water of a suitable quality for dust suppression activities complying with any water restrictions. | During construction | SPA | Daily and maintain records |
| A1.8: Schedule revegetation activities to ensure optimum survival of vegetation species. | During construction | SPA | Maintain records |
|  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| A2. Increase in vehicle / machinery emissions | A2.1: Ensure vehicles/machines are maintained, switched off when not in use and only required vehicles are operated onsite. | During construction and operation | SPA | Daily and maintain records |
| A2.2: Ensure al construction vehicles and machinery are properly maintained and operated in accordance with design standards and, design standards and manufacturers maintenance manuals. | During construction and operation | SPA | Daily and maintain records |
| A2.3: Develop and implement an induction program for all site personnel, which includes as a minimum an outline of the minimum requirements for environmental management relating to the site. | Pre and during construction | SPA | Daily and maintain records |
| A2.4 Locate vehicles/equipment storage areas as far as practicable from sensitive locations. | During construction and operation | SPA | Daily and maintain records |
|  |  |  |  |  |

## Noise and Vibration

### Background

1. There is no available data for continuous noise and vibration monitoring in the deltaic Mediterranean coast.
2. Existing sources of ambient noise may include: roads, power station, resorts and general urban noise. The expected ambient noise levels at the five hotspots are:

* Beheira hotspot: expected to have the lowest ambient noise level since the only noise source close to the project location is the international coastal road.
* Kafr El-Sheikh hotspot: Noise sources impacting the ambient levels at the hotspot location include the Burullus power station, Motobas industrial zone and the international coastal road.
* Dakahlia hotspot: Ambient noise levels are greatly affected by the existence of two urban cities and New Mansoura city “under construction” beside the coastal road.
* Damietta hotspot: Sources of ambient noise include the nearby resort activities, Damietta power station, New Damietta city and the international coastal road.
* Port Said hotspot: Ambient noise levels are affected by the existence of many industrial activities, including power generation, oil industry, pipe industry, in addition to two villages and the international coastal road.

1. The use of machinery or introduction of noise/vibration generating facilities could have an adverse effect on the environment and residents if not appropriately managed. Blasting is not required to be undertaken as part of this project.
2. Contractors involved in construction activities should be familiar with methods of controlling noisy machines and alternative construction procedures as contained within specific Egyptian legislation.
3. Potential noise sources during construction may include:
4. heavy construction machinery/vehicles, including soil compactors;
5. power tools, generators and pumps;

### Performance Criteria

1. The following performance criteria are set for the construction of the projects:

* Selection of efficient equipment and maintenance in accordance with manufacturers manuals
* As possible, small compactor units shall be used instead of heavy compactors.
* Ear protection PPE to be used by workers near noise/vibration generating equipment.
* No noisy equipment or machines are to be used during night hours
* Corrective action to respond to complaints and/or grievances is to occur within 48 hours

### Monitoring

1. Ambient noise levels will be carried out at the nearest sensitive locations to each “hotspot” location. The measurement frequency will be every two months during the construction phase.

### Reporting

1. All noise monitoring results and/or incidents will be tabulated and reported as outlined in the ESMF. The SPA must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to noise is exceeded.

Table 20 Noise and Vibration Management Measures

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | | **Action timing** | **Responsibility** | **Frequency** |
| N1: Increased noise levels | N1.1: Select plant and equipment and specific design work practices (e.g. worker’s training) to ensure that noise emissions are minimised during construction and operation including all compaction and pumping equipment and using different strategies/alternatives to limit noise pollution. | | All phases | SPA | Maintain records |
| N1.2: Utilize specific noise reduction devices such as silencers and mufflers. | | All Phases | SPA | Maintain records |
| N1.3: Restrict noise generating activities to daytime hours, as possible | | All Phases | SPA | Maintain Records |
| N1.4: Consultation with nearby residents in advance of construction activities particularly if noise generating construction activities are to be carried out outside of ‘daytime’ hours: 7am-5.30pm. | | Construction phase | All Personnel | Daily and maintain records |
| N1.5 Provide temporary construction noise barriers in the form of solid hoardings where there may be an impact on specific residents. | | Construction phase | SPA | Daily and maintain records |
| N1.6 All incidents complaints and non-compliances related to noise shall be reported in accordance with the site incident reporting procedures and summarised in the register. | | Construction phase | SPA | Maintain records |
| N1.7: The contractor shall conduct employee and operator training to improve awareness of the need to minimize excessive noise in work practices | | Construction Phase | SPA | Maintain Records |
| N2. Vibration due to construction | | N2.1: Identify properties, structures, underground services and habitat locations that will be sensitive to vibration impacts resulting from construction and operation of the project. | Pre and during construction | SPA | Maintain records |
| N2.2: Design to give due regard to temporary and permanent mitigation measures for noise and vibration from construction and operational vibration impacts. | Pre-construction | SPA | Maintain records |
| N2.3: All incidents, complaints and non-compliances related to vibration shall be reported in accordance with the site incident reporting procedures and summarised in the register. | Construction phase | SPA | Maintain records |

## Erosion, Drainage and Sediment Control

1. There are two main geological units in the Nile Delta region. These are the Quaternary deposits and the Tertiary deposits. The Quaternary deposits include the Holocene and Pleistocene sediments. The Holocene comprises sand dunes, coastal deposits, sabkha deposits and silty clay sediments capping the flood plain. This is where the five hotspots are found (The Research Institute for Groundwater (RIGW) in 1992).
2. The main geomorphologic features of the hotspot areas are shown in Figure 7, and are, more or less, similar. **These are:**
3. Offshore Submerged Plain: The offshore submerged plain is characterized by the occurrence of a number of limestone ridges. It is also known as the continental shelf until it reaches the outer shelf slope of depth 200 meters.
4. Foreshore Plain: The foreshore plain occupies the area determined by the coastal lakes and their inland extension into the brackish water lagoons. The landforms that exist in this plain include wetland areas of the main lakes and the “sabkha” deposits. Irrigation canals and drains break through these plains to serve the agricultural activities.
5. The hotspot locations also include sandy seashores with few shells and scattered algae; while shells and shell fragments increase landwards. Southwards, the landscape is characterized, in some areas, by the presence of numerous vegetated small sand dunes and sand mounds.

.

Figure 25: Geomorphologic units of the Nile Delta region (modified, RIGW 1992)

### Coastline Characterization

1. The coastline characteristics are reliant on factors such as: sediment transport, erosion or flooding, geomorphology (e.g. changes in orientation of the coastline), type of beaches (rocky, sandy) and on the degree of anthropization (presence, absence of coastal structures).
2. The following sections provide a description of the hotspot locations based on the following:

* An indicator of the type of coastline (the Coastal Type Indicator, CTI), to compute indicators of flooding and erosion.
* The CTI depends on the beach type (Beach Type Indicator, BTI) and on the degree of anthropization of the coastline (Human Disturbance Indicator, HDI) defined bellow.

#### Beach Type Indicator (BTI)

1. This indicator was designed specifically for the Egyptian Northern Coast based on the indicator of Gornitz et al., (1994) and later studies. Five types of beaches were identified, and ranked from 1 to 5, based on presence/lack of sandy beaches. The “1” value is assigned to the least vulnerable coasts to erosion and flooding, where beaches cannot be eroded, and “5”. As presented in Figure 18 below, the five hotspot areas exist in the most vulnerable zone (5 = Beaches).

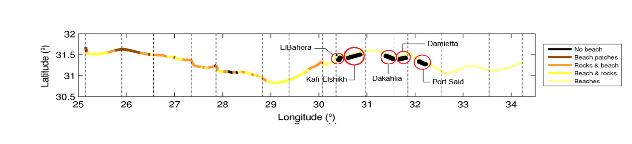


Figure 25: Beach type characterization along the Egyptian Northern Coast.

#### Human Disturbance Indicator (HDI)

1. The Human Disturbance Indicator represents the degree of anthropized coastline. As presented in Figure 26, a value of “1” corresponds to the least vulnerable coastlines (Coastline stretches with no coastal structures), while a value of “5” corresponds to the most vulnerable coastlines (highly anthropized). As presented in Figure 9, the most vulnerable hotspot areas are Port Said and Beheira followed by Damietta, whereas Kafr el Sheikh and Dakahlia were the least vulnerable.

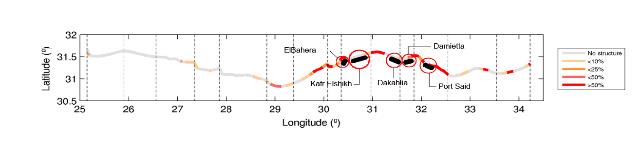


Figure 26: Coastal protection map. Percentage of coastal stretch affected by coastal structures.

#### Coastal Type Indicator (CTI)

1. The Coastal Type Indicator (CTI) is used for computation of erosion and flooding indicators, it depends on the beach type (Beach Type Indicator, BTI) and on the degree of anthropization of the coastline (Human Disturbance Indicator, HDI) from the following relation: CTI = (BTI + HDI) / 2. As presented in Figure 10, the most vulnerable hotspots are Beheira followed by Port Said and Damietta (Level: 4-5 high), while the least vulnerable are Kafr el Sheikh and Dakahlia (level:3 medium).

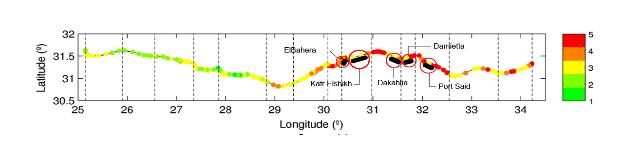


Figure 27: Coastal Type Indicator along the Egyptian Northern Coast.

### Flooding

1. The coastal flooding in the different coastal stretches was presented in Annex 1 (Hazard characterization and climate change) of the scoping study report of the integrated coastal zone management in the Northern Coast of Egypt. As presented in Figure 28, Beheira and Damietta have the highest flooding rate followed by Kafr el Sheikh and Dakahlia, while the lowest rate is at Port Said.

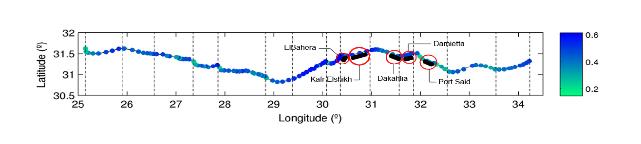


Figure 28: 99th percentile of the total flooding level for the period 1979‐2015 (m).

### Erosion

1. The coastal erosion in the different coastal stretches was presented in Annex 1 (Hazard characterization and climate change) of the scoping study report of the integrated coastal zone management in the Northern Coast of Egypt.
2. An indicator was utilized to evaluate erosion impacts in the Egyptian coastline has been obtained from the CTI and the BEI)which allows the evaluation of erosion of sandy beaches, Poulos (2014).
3. The objective of such indicator definition is to evaluate the potential drivers (sediment transport) and the potential erosion of the 5 hot-spots.
4. Potential beach erosion is related to the sediment transport magnitude in each coastal area (Sediment Transport Indicator, STI), and to the longer term erosion (Long Term erosion Indicator, LTI) related to the observed mean shoreline retreat occurrence (past and, for future scenarios) due to sea level rise (Hereher, 2014).
5. The final erosion index was finally obtained for the historical and future characterizations, as presented in Figure 29. The results showed that Beheira had the highest erosion index, followed by Kafr el Sheikh, Damietta and Port Said, while Dakahlia had the lowest erosion threat.

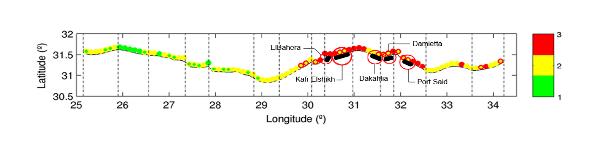


Figure 29: Erosion index along the Egyptian Northern coast. Historical characterization. When a coastal point is assigned to multiple coastal

### Saltwater intrusion index

1. The saltwater intrusion index in the different coastal stretches was presented in Annex 1 (Hazard characterization and climate change) of the scoping study report of the integrated coastal zone management in the Northern Coast of Egypt.
2. For the definition of the index over the historical period, 3 factors were taken into account: 1) information from stakeholders, 2) the coastal aquifer and 3) water bodies along the coastal stretch. For the evolution of saltwater intrusion across future scenarios, thresholds between low‐medium and medium‐high have been established as 10 cm and 20 cm of sea level rise, respectively, as presented in Figure 30, the saltwater threat is higher in Port Said and Damietta, medium in Kafr el Sheikh and Beheira, while it was low in Dakahlia.

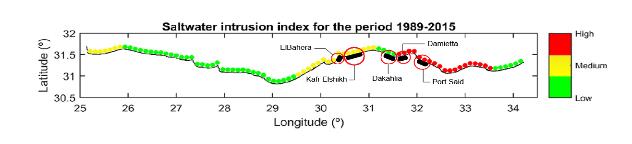


Figure 30: Saltwater intrusion index for the period 1989‐2015

### Performance Criteria

1. The following performance criteria are set for the project:
2. no build-up of sediment in the aquatic environments and/or surface and/or groundwater as a result of construction and operation activities;
3. no extra excavation outside the sites’ boundaries
4. all water exiting the project site and/or into groundwater systems is to have passed through best practice erosion, drainage and sediment controls; and
5. Effective implementation of site-specific EDSCP.
6. By following the management measures set out in the ESMF, construction and operation activities of the projects will not have a significant impact as a result of sedimentation across the broader area.

### Monitoring

1. conduct site inspections on a monthly basis or after rainfall events exceeding 20mm in a 24 hour period;
2. Observe coastline changes using satellite mapping

### Reporting

1. All sediment and erosion control monitoring results and/or incidents will be tabulated and reported as outlined in the ESMF. The SPA must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to erosion and sediment control is exceeded.
2. Develop a site-specific checklist to document non-conformances to this ESMF or any applicable EDSCPs; and
3. Communicate the results of inspections and/or water quality testing and ensure that any issues associated with control failures are rapidly rectified and processes are put in place to ensure that similar failures are not repeated.

Table 21 Erosion, Drainage and Sediment Control Measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| E1: Loss of soil material and sedimentation to the surface and/or groundwater systems from site due to earthwork activities | E1.1: Develop and implement an EDSCP for any surface works, embankments and excavation work, water crossings. | Construction phase | All Personnel | Maintain records |
| E1.2: Schedule/stage works to minimise cleared areas and exposed soils at all times and to ensure that major vegetation disturbance and earthworks are carried out during periods of lower rainfall and wind speeds. | Pre and during construction | SPA | Maintain records |
| E1.3: Incorporate the design and location of temporary and permanent EDSC measures for all exposed areas and drainage lines. These shall be implemented prior to pre-construction activities and shall remain onsite during work | Pre and during construction | SPA | Maintain records |
|  |  |  |  |
| E1.4: Schedule/stage works to minimise the duration of stockpiling topsoil material. Vegetate stockpiles if storage required for long periods. | During construction | All Personnel | Maintain records |
| E1.5: Locate stockpile areas away from drainage pathways, waterways and sensitive locations. | Pre and during construction | SPA | Maintain records |
| Loss of soil material and sedimentation to the surface and/or groundwater systems from site due to earthwork activities | E1.6: Design stormwater management measures and to reduce flow velocities and avoid concentrating runoff and set up a Storm Water Pollution Prevention Plan (SWPPP) | Pre and during construction | SPA | Maintain records |
|
|
| E1.7: Bunding shall be used either within watercourses or around sensitive/dangerous goods as necessary. | During construction | All Personnel | Maintain records |
|
|
| E2: Soil Contamination | E2.1: If contamination is uncovered or suspected (outside of the project footprints), undertake a Stage 1 preliminary site contamination investigation. The contractor should cease work if previously unidentified contamination is encountered and activate management procedures and obtain advice/permits/approval (as required). | Construction phase | All Personnel | Daily and maintain records |
| E2: Soil Contamination | E2.2: Adherence to best practice for the removal and disposal of contaminated soil/ material from site (if required), including contaminated soil within the project footprints. | Construction phase | All Personnel | Daily and maintain records |
| E2.3: Drainage control measures to ensure runoff does not contact contaminated areas (including contaminated material within the project footprints) and is directed/diverted to stable areas for release. | Construction phase | All Personnel | Daily and maintain records |
| E2.4: Avoid importing fill that may result in site contamination and lacks accompanying certification/documentation. Where fill is not available through on site cut, it must be tested in accordance with geotechnical specifications. | Construction phase | All Personnel | Daily and maintain records |

## Waste Management

### Background

1. The preferred waste management hierarchy and principles for achieving good waste management is as follows:
2. waste avoidance(avoid using unnecessary material on the projects);
3. waste re-use (re-use material and reduce disposing);
4. waste recycling (recycle material such as cans, bottles, etc.); and
5. waste disposal (all petruscible and/or contaminated waste to be dumped at approved landfills).
6. The key waste streams generated during construction are likely to include residual sediment and construction wastes such as:
7. the excavation wastes unsuitable for reuse during earthworks;
8. wastes from construction and drilling equipment maintenance. Various heavy vehicles and construction equipment will be utilised for the duration of the construction and drilling phase. Liquid hazardous wastes from cleaning, repairing and maintenance of this equipment may be generated. Likewise leakage or spillage of fuels/oils within the site needs to be managed and disposed of appropriately;
9. Wood and reed leftovers from construction of fences and wood/bamboo protection components;
10. non-hazardous liquid wastes will be generated through the use of workers’ facilities such as toilets; and
11. general wastes including scrap materials and biodegradable wastes.
12. Key waste streams generated during operation are likely to include:
13. excavated sediment (primarily sand and coral, which can be used for concrete or spread on suitable areas);
14. Wood and reed leftovers from construction of fences and wood/bamboo protection components; and,
15. used oil and machinery parts.

### Performance Criteria

1. The following performance criteria are set for the construction of the projects:
2. waste generation is minimised through the implementation of the waste hierarchy (avoidance, reduce, reuse, recycle);
3. no litter will be observed within the project area or surrounds as a result of activities by site personnel;
4. no complaints received regarding waste generation and management;
5. any waste from on-site portable sanitary facilities will be sent off site for disposal by a waste licensed contractor; and
6. waste oils will be collected and disposed through Petrotrade company for recycling.
7. Immediate response and reporting for any spill or leakage.
8. Workers involved in construction and operational activities should be familiar with methods minimising the impacts of clearing vegetation to minimise the footprint to that essential for the works and rehabilitate disturbed areas. By doing these activities, the projects should minimise the impact of waste generated by the project.
9. Prepare and maintain a waste management plan that takes into consideration all the points mentioned above.
10. Wastes of hazardous nature to be disposed of through licenced contractors under a complete chain-of-custody system.
11. Prepare waste and hazardous waste registers for all project activities, in accordance with the requirements of law 4 for 1994.

### Monitoring

1. Monitoring of waste volumes and ensuring that they match the chain-of-custody, particularly for wastes of hazardous nature.
2. Monitoring/patrolling housekeeping, waste storage and handling on site.

### Reporting

1. The EEAA must be notified immediately and SPA take action in the event of any serious environmental harm due to improper waste management.

Table 22 Waste Management Measures

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | | **Action timing** | **Responsibility** | **Frequency** |
| WT1: Production of wastes and excessive use of resources | WT1.1: Preference shall be given to materials that can be used to construct the project that would reduce the direct and indirect waste generated. | | Pre and during construction | SPA | Maintain records |
|
| WT1.2: The use of construction materials shall be optimised and where possible a recycling policy adopted. | | During construction | SPA | Weekly and maintain records |
| WT1.3: Separate waste streams shall be maintained at all times i.e. general domestic waste, construction and contaminated waste. Specific areas on site shall be designated for the temporary management of the various waste streams. | | During construction | SPA | Weekly and maintain records |
| WT1.4: Any contaminated waste shall be disposed of at an approved facility. | | During construction | SPA | Weekly and maintain records |
| WT1.5: Recyclable waste (including oil and some construction waste) shall be collected separately and disposed of correctly (Recycled through Petrotrade). | | During construction | SPA | Weekly and maintain records |
| WT1.6: Waste containers shall be sufficiently covered to ensure that wildlife does not have access. | | During construction | SPA | Daily |
| WT1.7: Disposal of waste shall be carried out in accordance with the Government of Egypt requirements. | | During construction | SPA | Weekly and maintain records |
| WT1.8: Fuel and lubricant leakages from vehicles and plant shall be immediately rectified. | | During construction | SPA | Daily and maintain records |
| WT1: Production of wastes and excessive use of resources | | WT1.9: Major maintenance and repairs shall be carried out off-site whenever practicable. | During construction | SPA | Weekly and maintain records |
| WT1.10: Where possible, fuel and chemical storage and handling shall be undertaken at central fuel and chemical storage facilities, such as petrol stations. | During Construction | SPA | Daily and maintain records and report any incidents |
| WT1.11: Any dangerous goods stored on site shall be stored in accordance with Egypt regulations. | During Construction | SPA | Daily and maintain records |

## Social Management

### Background

1. Population data for the relevant governorates was acquired from the Central Agency for Public Mobilization and Statistics (CAPMAS). Numbers are expressed in thousands of male and female for each age group by 5 years interval.
2. **Demography**
3. Beheira: The population was recorded to be 4,747,283 in 2006[[8]](#footnote-8), the number of males was 2,433,814 while the number of females was 2,313,469, demonstrating a male/female ratio of 1.05:1. Population showed highest values in youth age groups (15-,20-), while it showed the lowest number in age groups (70-,75+), as presented in Figure 31.

Figure 31: Population Pyramid for Beheira in 2006

1. Kafr El Sheikh: The population of was recorded to be 2,620,208 in 2006, the number of males was 1,324,211 while the number of females was 1,295,997, showing a male/female ratio of 1.02:1. The number of populations showed the highest numbers in the youth age groups (Less than 5, 10-, 15-, 20-), while it showed the lowest number in age groups (70-,75+), as presented in Figure 32.

Figure 32: Population Pyramid for Kafr El Sheikh in 2006

1. Dakahlia: The population was recorded to be 4,989,997 in 2006. The number of males was 2,534,118 while the number of females was 2,455,879, showing male/female ratio of 1.03:1. The number of populations showed the highest numbers in the youth age groups (15-, 20-), while it showed the lowest number in age groups (70-,75+), as presented in Figure 33.

Figure 33: Population Pyramid for Dakhlia in 2006

1. Damietta: The population was recorded to be 1,097,339 in 2006. The number of males was 561,100 while the number of females was 536,239, showing a male/female ratio of 1.03:1. The number of populations showed the highest numbers in the youth age groups (15-, 20-), while it showed the lowest number in age groups (70-,75+), as presented in Figure 34.

Figure 34: Population Pyramid for Damietta in 2006

1. Port Said: The population was recorded to be 570,603 thousands in 2006. The number of males was 290,580 thousands, while the number of females was 280,023, showing a male/female ratio of 1.03:1. The number of populations showed the highest numbers in the youth age groups (15-,20-,25-), while it showed the lowest number in age groups (65-,70-,75+), as presented in Figure 35.

Figure 35: Population Pyramid for Port Said in 2006

1. Land use

Land uses in the different project hotspot locations are presented in the following sections.

* **Beheira Hotspot**
* The international coastal road runs south of the Beheira hotspot, in addition to the existence of agricultural lands.



Figure 36: Landuse Map of Beheira Hotspot

* **Kafr El-Sheikh Hotspot**
* East: Aquaculture, Burullus power station , agricultural lands and two cultural heritage sites (Kom El Meqassabeh, Tell El Maqlowbeh)
* West: Motobas Industrial zone and agricultural lands
* South: Burullus lake, International coastal road, agricultural lands

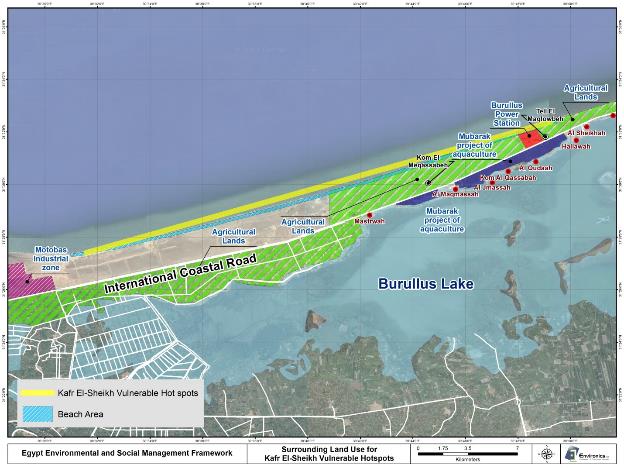


Figure 37: Landuse Map of Kafr El-Sheikh Hotspot

* **Dakahlia Hotspot**
* East: Urban (15 of May city and beach resorts along Gamasa city)
* West: pumping station pumping irrigation water from ElSalam drain to the sea.
* South: New Mansoura city under construction, followed by the international coastal road, Delta University and Gamasa industrial city.



Figure 38: Landuse Map of Dakahlia Hotspot

* **Damietta Hotspot**
* East: Summer resorts, chalets and beach on the coast.
* West: Damietta power station
* South: Resorts, university, recreational areas, followed by the international coastal road and New Damietta city and agriculture.

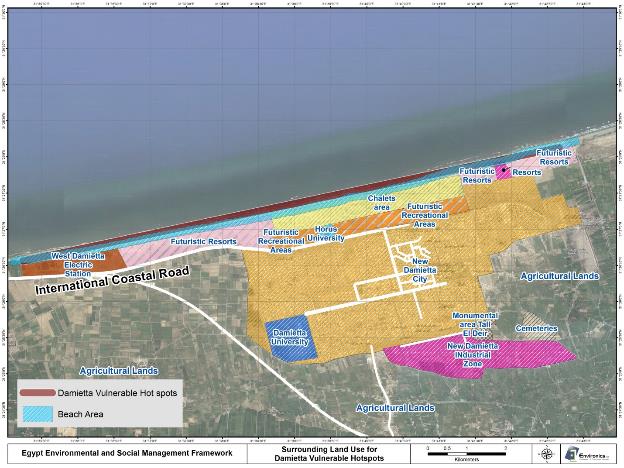


Figure 39: Landuse Map of Damietta Hotspot

* **Port Said Hotspot**
* East: United Gas Derivatives Company, El Gamil Gas Plant, El Garabaa Village.
* West: El Deiba Village.
* South: : International Pipe Industry Company, El Manasra Village, Pheronic Petroleum Company, Petrojet for pipes packing, the international coastal road followed by several Fish farms along the area.



Figure 40: Landuse Map of Port Said Hotspot

1. The project has been designed with the assistance of stakeholders and aims to provide benefits to the broader community. It is important that potential areas of tension are recognised early and appropriate actions taken to avoid or minimise conflict.
2. The project and its sub-projects do not require involuntary resettlement or acquisition of land although they may impact on land during construction activities which will be temporary in nature.
3. Stakeholder meetings revealed that both male and female workers can be sourced from the different locations. Burullus lake includes reeds that can be woven by women at their homes (after drying) and supplied to the project.

### Performance Criteria

1. The following performance criteria are set for the project:

* Representation of all relevant stakeholders.
* Consultation activities in the different project phases.
* Avoid construction activities during summer time in areas known for beach accessibility for recreational activities, as possible.
* Provide temporary access points for fishermen during construction.
* Coordinate project implementation schedule with communities.
* Engagement and compensation of potentially impacted persons.
* Minimize use of dredged material and maximize sand use for construction of the dykes.
* Monitor behaviour of responsible persons controlling access points to eliminate possibility of bullying.
* Selection of easily accessible dykes in resort/recreational areas
* Long-term social benefits are achieved.
* complaint and grievance mechanisms are put in place and proactively managed;
* Local stakeholders and community members have a key role to play in the implementation and monitoring of the project.
* Consultation with stakeholders will continue. This will help ensure that stakeholders continue to be aware of the project, its progress and any changes in the project. It will also assist in identifying any issues as they arise.
* SPA will be responsible for advisory support and extensions services to local beneficiaries along with being responsible for distributing material inputs and providing technical training and backstopping in the implementation of programme activities.

### Reporting

1. Records of all consultations are to be kept and reported on monthly basis.
2. The SPA must be notified in the event of any individual or community complaint or dissatisfaction and ensure the Grievance Redress Mechanism is complied with.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 23: Social Management Measures | | | | |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| SM1: SM Land in use/ Public nuisance caused by construction/operation activities (eg noise, dust etc) | SM 1.1: Carry out community consultation on the purpose and benefits of making changes to land use | Pre-construction | SPA | Maintain records |
| SM 1.2: Get community buy-in on any change of land use | Pre-construction | SPA | Maintain records |
| SM 1.3: Ensure compliance with the Grievance Redress Mechanism process | Entire construction and operation phase | SPA | Maintain records |
| SM 1.4: Implement appropriate management plans (refer to Noise, Air, ESCP, and Waste sections of the ESMF) | Construction and operation | SPA | Daily and maintain records |

## Archaeological and Cultural Heritage

### Background

1. There are no known archaeological and cultural heritage sites within the specific hotspot locations or nearby them.

### Performance Criteria

1. The following performance criteria are set for cultural heritage issues related to the project:

* There will be no impact on any important Archaeological, Indigenous and/or Cultural Heritage sites.
* Where there is a mix of modern development and traditional areas within villages, community engagement will be carried out to confirm options of enabling future development.
* Should any important Archaeological, Indigenous and/or Cultural Heritage sites be found, immediately cease work within the area that the site has been observed and consult with the Egyptian Ministry of State of Antiquities and UNDP.

### Monitoring

1. Observation during pre-construction and construction activities.
2. Local stakeholders and community members have a key role to play in the implementation and monitoring of the project.
3. Consultation with stakeholders will continue. This will help ensure that stakeholders continue to be aware of the project, its progress and any changes in the project. It will also assist in identifying any issues as they arise.
4. SPA will be responsible for advisory support and extensions services to local beneficiaries along with being responsible for distributing material inputs and providing technical training and backstopping in the implementation of programme activities.

### Reporting

1. Notification to the Supreme Council of Antiquities in case of any find.

Table 24: Archaeological Management Measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| CH1: Damage or disturbance to significant important Archaeological, Indigenous and/or Cultural Heritage during the earth disturbances and land clearing activities | CH1.1: Should any important Archaeological, Indigenous and/or Cultural Heritage sites be found, immediately cease work within the area that the site has been observed and consult with the Egyptian Ministry of State of Antiquities and UNDP. | Pre and during construction | SPA | Daily, maintain records and immediately notify UNDP and the Egyptian Ministry of State of Antiquities of any find |

## Emergency Management Measures

### Background

1. In the event of actions occurring, which may result in serious health, safety and environmental (catastrophic) damage, emergency response or contingency actions will be implemented as soon as possible to limit the extent of environmental damage.
2. The delivery organisation will need to incorporate emergency responses into the project complying with the requirements under the Occupational, Health and Safety Policy of the delivery organisation and the relevant Egyptian legislation.

### Performance Criteria

1. The following performance criteria are set for the construction of the projects:

* no incident of fire outbreak;
* no major fuel spills;
* no preventable work related accidents;
* provide an immediate and effective response to incidents that represent a risk to public health, safety or the environment; and
* minimise environmental harm due to unforeseen incidents.

### Monitoring

1. An emergency response monitoring program will be developed for the project. The program is subject to review and update at least every two months from the date of issue. Importantly, visual inspections will be conducted by SPA daily with reporting to UNDP staff on a weekly basis (minimum) noting any non-conformances to this ESMF.

### Reporting

1. The SPA and UNDP staff must be notified immediately in the event of any emergency, including fire or health related matter including those that have resulted in serious environmental harm.

Table 25 Emergency Management Measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue** | **Control activity (and source)** | **Action timing** | **Responsibility** | **Frequency** |
| E1. Fire and Emergency management and prevention strategies implemented | E1.1: Flammable and combustible liquids bunding/storage areas to be designed in accordance with appropriate international standards | Pre and during construction | SPA | Daily and maintain records |
| E1.2: Fire extinguishers are to be available on site | During construction | SPA | Daily and maintain records |
| E1.3: No open fires are permitted within the project area | During construction | SPA | Daily and maintain records |
| E1.4: Communication equipment , emergency protocols and Training provision to all staff on emergency preparedness. To be established prior to commencement of construction activities. |  |  |  |
|  |  |  |  |
| E1.5: Check and replenish First Aid Kits | During construction | SPA | Daily and maintain records |
| E1.6: Use of Personal Protection Equipment | During construction | All Personnel | Daily and maintain records |

# Budget for ESMF Implementation

1. A budget has been prepared for the implementation of the ESMF as follows:

|  |  |
| --- | --- |
| **Item** | **Preliminary Estimated Cost ($)** |
| ESMF Updating and Auditing | 10000[[9]](#footnote-9) |
| General ESMF Expenses | 200005 |
| Ecological Monitoring (40 sites - two assessments/year over five years) | 135000 |
| Water Quality Monitoring (monitoring to be undertaken over five years) | 35000 |
| Water Quality Sample Laboratory Analysis (monitoring to be undertaken over five years) | 30000 |
| Sediment Sample Field Testing (monitoring to be undertaken over five years) | 25000 |
| Sediment Sample Laboratory Analysis (monitoring to be undertaken over five years) | 40000 |
| Erosion, Drainage and Sediment Control | 15000 |
| Archaeological Management | 0 |
| Stakeholder Engagement Workshop | 1400005 |
| Grievance Redress Mechanism | 500005 |
| **Total** | **500,000** |

Notes for calculation of the above preliminary estimates:

* The estimated cost includes Weed/ alien species monitoring - Habitats monitoring - Flora and fauna (including birds and marine) over 14 points in the five sites twice a year in 5 years.
* Compaction water quality: 22 samples during construction
* Marine Water quality: twice a year over 5 years for each location
* Ground water: preparation of 15 permanent monitoring wells and sampling over the five year period (twice a year)
* Sediment monitoring: onsite sampling (heavy metals, PCB, VOC, organic N and P) and Laboratory analysis of 196 samples during construction
* Erosion monitoring via acquiring annual satellite maps for the 5 hotspot areas, including GIS effort.
* The prices above only include the Ecological, Water and Sediment monitoring, other cost are not included such as; training, oil spill kits, accommodation.

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Annexure One: Community Consultation and Stakeholder Engagement Information

Annexure Two Guidance for Submitting a Request to the Social and Environmental Compliance Unit and/or the Stakeholder Response Mechanism

Guidance for Submitting a Request to the Social and Environmental Compliance Unit (SECU) and/or the Stakeholder Response Mechanism (SRM)

**Purpose of this form**

* **If you use this form, please put your answers in bold writing to distinguish text**
* **The use of this form is recommended, but not required. It can also serve as a guide when drafting a request.**

This form is intended to assist in:

1. Submitting a request when you believe UNDP is not complying with its social or environmental policies or commitments and you are believe you are being harmed as a result. This request could initiate a ‘compliance review’, which is an independent investigation conducted by the Social and Environmental Compliance Unit (SECU), within UNDP’s Office of Audit and Investigations, to determine if UNDP policies or commitments have been violated and to identify measures to address these violations. SECU would interact with you during the compliance review to determine the facts of the situation. You would be kept informed about the results of the compliance review.

and/or

1. Submitting a request for UNDP “Stakeholder Response” when you believe a UNDP project is having or may have an adverse social or environmental impact on you and you would like to initiate a process that brings together affected communities and other stakeholders (e.g., government representatives, UNDP, etc.) to jointly address your concerns. This Stakeholder Response process would be led by the UNDP Country Office or facilitated through UNDP headquarters. UNDP staff would communicate and interact with you as part of the response, both for fact-finding and for developing solutions. Other project stakeholders may also be involved if needed.

Please note that if you have not already made an effort to resolve your concern by communicating directly with the government representatives and UNDP staff responsible for this project, you should do so before making a request to UNDP’s Stakeholder Response Mechanism.

**Confidentiality** If you choose the Compliance Review process, you may keep your identity confidential (known only to the Compliance Review team). If you choose the Stakeholder Response Mechanism, you can choose to keep your identity confidential during the initial eligibility screening and assessment of your case. If your request is eligible and the assessment indicates that a response is appropriate, UNDP staff will discuss the proposed response with you, and will also discuss whether and how to maintain confidentiality of your identity.

**Guidance**

When submitting a request please provide as much information as possible. If you accidentally email an incomplete form, or have additional information you would like to provide, simply send a follow-up email explaining any changes.

**Information about You**

Are you…

1. A person affected by a UNDP-supported project?

Mark “X” next to the answer that applies to you: Yes: No:

1. An authorized representative of an affected person or group?

Mark “X” next to the answer that applies to you: Yes: No:

*If you are an authorized representative, please provide the names of all the people whom you are representing, and documentation of their authorization for you to act on their behalf, by attaching one or more files to this form.*

1. First name:
2. Last name:
3. Any other identifying information:
4. Mailing address:
5. Email address:
6. Telephone Number (with country code):
7. Your address/location:
8. Nearest city or town:
9. Any additional instructions on how to contact you:
10. Country:

**What you are seeking from UNDP: Compliance Review and/or Stakeholder Response**

You have four options:

* Submit a request for a Compliance Review;
* Submit a request for a Stakeholder Response;
* Submit a request for both a Compliance Review and a Stakeholder Response;
* State that you are unsure whether you would like Compliance Review or Stakeholder Response and that you desire both entities to review your case.

1. Are you concerned that UNDP’s failure to meet a UNDP social and/or environmental policy or commitment is harming, or could harm, you or your community? Mark “X” next to the answer that applies to you: Yes: No:
2. Would you like your name(s) to remain confidential throughout the Compliance Review process?

Mark “X” next to the answer that applies to you: Yes: No:

If confidentiality is requested, please state why:

1. Would you like to work with other stakeholders, e.g., the government, UNDP, etc. to jointly resolve a concern about social or environmental impacts or risks you believe you are experiencing because of a UNDP project?

Mark “X” next to the answer that applies to you: Yes: No:

1. Would you like your name(s) to remain confidential during the initial assessment of your request for a response?

Mark “X” next to the answer that applies to you: Yes: No:

If confidentiality is requested, please state why:

1. Requests for Stakeholder Response will be handled through UNDP Country Offices unless you indicate that you would like your request to be handled through UNDP Headquarters. Would you like UNDP Headquarters to handle your request?

Mark “X” next to the answer that applies to you: Yes: No:

If you have indicated yes, please indicate why your request should be handled through UNDP Headquarters:

1. Are you seeking both Compliance Review and Stakeholder Response?

Mark “X” next to the answer that applies to you: Yes: No:

1. Are you unsure whether you would like to request a Compliance Review or a Stakeholder Response? Mark “X” next to the answer that applies to you: Yes: No:

**Information about the UNDP Project you are concerned about, and the nature of your concern:**

1. Which UNDP-supported project are you concerned about? (if known):
2. Project name (if known):
3. Please provide a short description of your concerns about the project. If you have concerns about UNDP’s failure to comply with its social or environmental policies and commitments, and can identify these policies and commitments, please do (not required). Please describe, as well, the types of environmental and social impacts that may occur, or have occurred, as a result. If more space is required, please attach any documents. You may write in any language you choose
4. Have you discussed your concerns with the government representatives and UNDP staff responsible for this project? Non-governmental organisations?

Mark “X” next to the answer that applies to you: Yes: No:

If you answered yes, please provide the name(s) of those you have discussed your concerns with

Name of Officials You have Already Contacted Regarding this Issue:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| First Name | Last Name | Title/Affiliation | Estimated Date of Contact | Response from the Individual |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. Are there other individuals or groups that are adversely affected by the project?

Mark “X” next to the answer that applies to you: Yes: No:

1. Please provide the names and/or description of other individuals or groups that support the request:

|  |  |  |  |
| --- | --- | --- | --- |
| First Name | Last Name | Title/Affiliation | Contact Information |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Please attach to your email any documents you wish to send to SECU and/or the SRM. If all of your attachments do not fit in one email, please feel free to send multiple emails.

Submission and Support

To submit your request, or if you need assistance please email: [project.concerns@undp.org](mailto:project.concerns@undp.org)

1. Intergovernmental Panel on Climate Change [↑](#footnote-ref-1)
2. El-Shinnawy, I. (2008). Coastal Vulnerability to Climate Changes and Adaptation Assessment for Coastal Zones of Egypt, Final Report. Ministry of Water Resources and Irrigation (MWRI), National Water Research Center (NWRC), Coastal Research Institute (CoRI) [↑](#footnote-ref-2)
3. Marcos, M., Jordà, G., Gomiz, D., and Perez, B. (2011). Changes in storm surges in southern Europe from a regional model under climate change scenarios. Global & Planetary Change, 77, 116-128. [↑](#footnote-ref-3)
4. El-Shinnawy, I., et al (2008). Climate Change Risks to Coastal Development and Adaptation Options in the Nile Delta [↑](#footnote-ref-4)
5. The Beheira design is the only design that includes some rock protection [↑](#footnote-ref-5)
6. The IFC World Bank ESIA categorization is in a reverse order as it considers Category A projects have the most significant and Category C projects have the least significant impacts. [↑](#footnote-ref-6)
7. Egypt State of the Environment Report, EEAA 2009 [↑](#footnote-ref-7)
8. Latest CAPMAS publication [↑](#footnote-ref-8)
9. Not calculated, taken from older template [↑](#footnote-ref-9)