

CHAPTER 1

INTRODUCTION

Damietta Port Authority in Egypt is planning to establish a new containers terminal as an extension to Damietta Port. Wataniya Environmental Services Co. (WES) has been invited by Kuwait Gulf Link Ports International (KGLPI) to undertake Baseline Environmental Study (EBS) and Environmental Impact Assessment (EIA) Study for the purpose of Damietta Port Project. In response to the KGLPI invitation and in view of the EEAA statutory requirement, WES had been undertake the Baseline environmental Study and Environmental Impact Assessment and submit the report as required by our client.

The Environmental Baseline Survey (EBS) provides an overview of the existing Environmental conditions both inside and outside Damietta Port and is presented as part of the Environmental Impact Assessment (EIA) for the new extension of Damietta Port. The purpose of this study is to carry out an EBS and EIA for the Port extension and development Project to be implemented in the Damietta Port in Egypt.

EIA is one of the main types of environmental appraisal work that is required by the Egyptian Environmental Affairs Agency (EEAA). The EIA is the most significant tool and a multidisciplinary approach that helps in assessing the environmental impacts of the construction and operation of the port in regard with the project and identifying the mitigation measures. The Environmental Assessment is the primary objective of understanding the proposed project and their associated environmental consequences for adopting alternatives, preventives, mitigations and helps as paramount scale to decision makers.

Brief Overview of the Region and Strategic Setting of the Port

Damietta is located on a narrow strip of land between the Nile and Lake Manzalah. It is 210 km northeast of Cairo and 15 km from the Mediterranean with geographical coordinates as Latitude: 31°26'N and Longitude: 31°48'E (Fig 1.1). The Governorate is bounded by the Mediterranean to the north, Manzala Lake to the east and by the Daqahlia Governorate to south and west.



**Fig. 1.1 Remote sensing images showing the location of the Harbor site,
(Source: Google Earth 2006).**

Summary of Regional Capacities:

The port of Damietta is situated near the eastern branch of the River Nile estuary, approx 70km W of Port Said, 250km E of Alexandria. The Port of Damietta is strategically located on the international transport lane as well as for domestic supply to Egypt. Most important competition for Damietta on container transshipment activities on the international route can be found by the port of Tauro, Port Piraeus, and Port Said. Total throughout capacity offered through these ports is approximately 9.9 million TEU annually. Of these 9.9 million TEU 4 million TEU capacities is offered in Egypt, making Egypt the most important Container Handling hub in the region. The port handles exports of agricultural products, fertilizers and furniture. Imports include cement, grain and general cargo. Approx 1,500 vessels and 9,000,000t of cargo handled annually. Container terminal has an annual handling capacity of 500,000 TEU.

Taking into consideration current throughput figures amounting to approximately 8 million tons (where by Port Said is estimated to have a throughput of 2 million), a spare capacity of container handling of 1.9 million TEU can be found in the region. One of the advantages of a transshipment terminal located in Egypt, over a transshipment terminal located in the other countries, are the lower overhead costs combined with the same modern equipments as being offered in other places.

Existing Port: Damietta Port is located on the northeastern coast of the Nile delta, Egypt. The harbor was constructed in 1982 and is located about 9.7 km west of the Damietta Nile promontory with an area of approximately 9.3 km², of which 3.2 km² is water mass . The harbor basin was dredged inland and its entrance was protected by two breakwaters. The western breakwater extends about 1500 m parallel to the navigation channel, attaining the 7m-depth contour. The eastern one is about 500m long, perpendicular to the shoreline, and extends to about the 3m-water depth contour. These breakwaters were designed to avoid the easterly and westerly sediment transport from bypassing the navigation channel. The navigation channel extends offshore to the middle shelf or about 20 km with an average water depth of about 15m. Since January 1984, the channel of the harbor has experienced sedimentation and subsequently threatening the navigation activities.

The coastline of the Harbor is sandy, gently curved with a general NNE-SSW orientation. Beaches and backshore sand flat consist primarily of very fine to medium loose quartz sands, micas, heavy minerals (generally opaque), feldspars and minor amount of shell fragments. Further east, at ~5.0 km distance, the coastline is interrupted by the detached breakwater system built to combat beach erosion at Ras El Bar resort beach. The width of the sandy coastal flat ranges from 0.2 to 2.0 km. The beach and coastal flat are relatively still under-development and unused except for the recreation beach at the New Damietta City about 6.7 km west of the harbor and at Ras El Bar ~6.0 km to the east. A 4.5 km long canal was constructed to facilitate domestic navigation between the harbor basin and the Damietta River branch. Marked beach and coastal processes changes have been reported due to the construction of the harbor breakwater leading to shoreline instability.

The port is bordered by an imaginary line connecting the eastern and western external breakwaters. The approach channel is 11.3 km long, 15 m. deep, and 300 m. wide, decreasingly reaching 250m at breakwater fringe. The approach channel is bordered by 18 nightly-lit buoys. The western breakwaters 1640 m. long with 140 m. land based and 1500 m. sea-based area. The eastern breakwater is 738 m. long with 200 m. land-based and 538m sea-based area. Both breakwaters are made of stacked artificial acropods topped with concrete head.

The barge channel consists of two sections; one is 1350 m. long connecting the barge dock to the sea and the other is 3750 m. connecting the dock to the Nile estuary. The barge dock area itself is 250x250m comprising a 250 m. long, 5m deep quay. The turing basin inside the port has a diameter of 500 m. with 14.5 m. depth at the container berth, and 12 m. depth at the general cargo berth. Table (1.1) provides some general port data

Table 1.1. Damietta Port General Information.

<i>Total Area</i>	<i>11,800,000</i>	<i>sq.m.</i>
<i>Water Area</i>	3,200,000	sq.m.
<i>Land Area</i>	8,600,000	sq.m.
<i>Total Warehouses Area</i>	142,510	sq.m
<i>Total Yards Area</i>	1,254,231	sq.m
<i>Total Silos Area</i>	98,304	sq.m
<i>Maximum Port Length</i>	4 km	
<i>Max. Ship Size</i>	14 m. draft-vessels	
<i>Working Hours</i>	24 h. per day (scheduled time)	

Damietta port is characterized with a construction area that covers about 25 km. The navigational channel (canal entrance) is about 11.3 km long and 300 m wide which gradually decreases till it reaches 250 m at water break and 15 m depth. The channel is marked with 18 buoys which are lit at night, odd numbers on the right and even numbers on the left, There is an external waiting area. The western water break is about 1500 m seaward long and its landward is about 140 m with a total of 1640 m. The Eastern water break is about 538 m long seaward and about 200 landward with a

total of 738 m. The water breaks are protected from the external side the industrial acid bocks and they are topped by a cement layer. An imaginary line links between the two ends of the external eastern and western break waters for Port dimension.

The barge channel consists of two ports one is 1350 m that links the barges dock to the sea and other is 3750 m that links to the dock to the Nile branch. The area of the barge dock is 250 x 250 m and it is equipped with a berth of 250 m long where water depth is 5 m deep. Diameter of the rotation dock is 500 m and its depth is 14.5 m in front of the containers berth and 12 m in front the general cargo berths.

The present project involves the extension of the harbor area. The proposed project will occupy approximately 130 hectares of land at the port (Fig. 1.2). There will be dredging involved for the project, but there will be no changes on the inlet itself. The area has witnessed high amounts of siltation.

NEW TERMINAL DEVELOPMENT

A new container terminal with cargo quay walls, storage areas and new buildings are scheduled to be constructed in the concession area. The proposed area for the development is the Port of Damietta, Egypt and the proposed works comprise an extension of an existing basin within the port area (Fig. 1.2). The existing basin is to be extended by about 1.5km, widened to a total of 325m and deepened to about 18m. The proposed project will occupy approximately 130 hectares of the land behind the existing channel. The dredging for the basin extension is not going to include dredging of the access channel.

The new container terminal is designed for two phases of development.

Phase I- *The terminal will be able to handle up to about 2.5 million TEU.*

In the first phase of the project, the concessionaire will develop and construct a new container terminal in the port of Damietta with a capacity in this phase of 2.5 million TEU. The existing land area, the concession area, will be dredged to a depth of 16.5 m in order to create docking basin with a width of 325 m. Parallel to the dredging activities, the northern quay wall will be constructed. The northern quay will be about 1020 m long with a water depth of 16.5 m suitable for the present container vessels

(8000 TEU) and future vessels (10,500 TEU). The terminal will reach a capacity of 1.5 million TEU with the 1020 m quay wall, which is according to the traffic forecast sufficient for the first years.

Phase 2- Full development; the terminal will have a capacity of 4 million TEU.

The development of Phase 2 consists of mainly of the purchase of additional equipment and the construction of the additional stacking areas necessary for the handling of about 4 million TEU.



Fig. 1.2. Proposed area for construction:

CLIMATE

The region is characterized by a typical Mediterranean climate with winter temperatures between 12 °C and 20 °C and summer temperatures between 18 °C and 33 °C. The water temperature varies from 13 °C in winter to more than 30 °C in summer. The annual rainfall averages 75-150 mm and the winds are mainly northern, north-eastern and western during summer and north eastern, northern, southeastern and western during winter, with a direct influence on the exchanges between the lake Manzalah and the open sea.

Table (1.2): Meteorological data for some cites at Damietta Governorate during December 2005. The daily rate of temperature ranges between 16 and 21 °C while the average daily temperature is about 19 °C. The average daily rate of relative humidity was 55% and the total average relative humidity was 38%. Mild to disturbed Wind was observed with average range of wind speed between 0.8 to 3.4 m/sec⁻¹ (Fig. 1.3).

Table 1.2. Meteorological Data at Damietta Area

<i>Surface Meteorological Data for some Cites</i>										
<i>Station</i>	Maximum Temperature (°C)			Maximum Temperature (°C)			Relative Humidity		Precipitation	
	Av	Level	Range	Av.	Level	Range	Av.	Range	All	Level
<i>Damietta</i>	20	19.7	13-24.2	12.7	10.8	8.4 -16.8	76	38-100	13.1	23.9
<i>AL Gamil</i>	20.7	19.3	13.9-24	14.8	13.2	9.4 -18.8	73	34-96	5.7	11.9
<i>Balteam</i>	20.4	19.3	12.2-25	13.2	12.3	8 -17.3	72	36-89	25.8	41.2
Al-Mansoura	20.4	20.3	13.6-25.6	9.2	8.5	0.3 -14.2	74	27-100	0.4	9.2

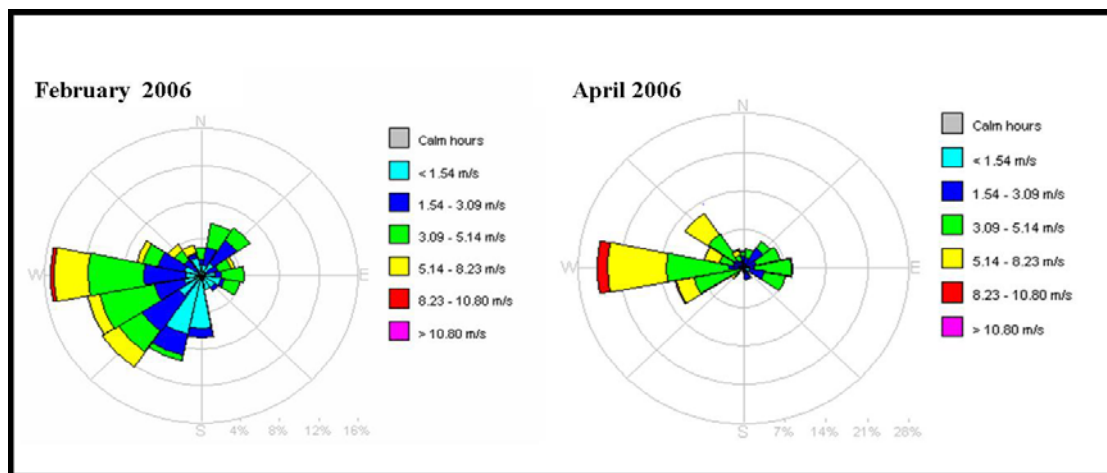


Fig. 1.3. Wind Rose for Damietta area.

Objectives of the study:

Baseline information is important reference point for conducting EIA. The term "baseline" refers to the collection of background information on the biophysical, social and economic settings proposed project area. The task of collecting baseline data starts right from the period of project inception; however, a majority of this task may be undertaken during scoping. Baseline data are collected for two main purposes. These purposes are:

- To provide a description of the status and trends of environmental factors (e.g., air pollutant concentrations) against which predicted changes can be compared and evaluated in terms of importance, and
- To provide a means of detecting actual change by monitoring once a project has been initiated

The objective of this report is to provide an Environmental Baseline Studies (EBS) that can be used in the preparation of the EIA of the extension of Damietta Harbor basin project. The following section describes the results of environmental baseline survey, during the period of July-August 2006. This Environmental Baseline Survey (EBS) will form part of the detailed EIA study. The EBS will contain the following issues

1. Land and water Use
2. Demographic and Socioeconomic Aspects
3. Geology and groundwater
4. Soil Characteristic
5. Coastal and Marine Environment
6. Shoreline Stability, Hydrodynamic Processes and Coastal Issues
7. Terrestrial and Aquatic ecology
8. Ambient air quality monitoring, Meteorology and Noise

Appendix 1 represents the preliminary report showing the activities during field survey at Damietta Port.