

Construction of the naval port in the town of Tunis, Tunisia – application of the Czech obligations relating to the OECD requirements as regards the export intentions influencing the environment

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Construction and reconstruction of the La Goulette port is situated in the Gulf of Tunis, in the territory comprising the coastline area of Tunisia and the La Goulette seashore stretching from Sidi Bou Saïd in the north to Radès in Hammam Lif in the south. The Gulf of Tunis creates a recipient of the two most important rivers of Tunisia: the Merdjeda river and the Meliane river.

The Merdjeda river is the most important watercourse of Tunisia, with its basin in the scope of 23,500 km² and its length of 430 km. Its average flow is 29 m³/s, an average flow of floating debris is 10 % - every year it brings 17 million tons of solid material to the Gulf of Tunis. These quantities of the solid matters are decreased by 3 million tons after construction of the Mellègue dam and they will not in fact be more than 9 million tons after filling up the Sidi Salem dam (Ben Mammou, 1998). The amount of the solid floating debris from the Merdjeda river to the Gulf of Tunis will in fact be 5 million tons.

The Meliane river dewateres the basin with its extent of 2,280 km² and its length is 160 km. Its flow is about 50 million m³/year, with its capacity of solid substances at the level of 20,400 tons/year. Two waterworks (the El Kébir dam and the Bir M'chergua dam) built in the basin decreased substantially the amount of the floating debris as well as waters. The waters are polluted with draining of 50 % waste waters, especially at the lower watercourse stretch.

The La Goulette-Radès port complex is supplied with waters via waters of the bay and two Tunis lagoons. Therefore, the quality of its waters was improved in consequence of actions implemented at the level of two sheets of the water lagoons enabling draining of waste waters to the sewerage system.

This was managed above all by

- scraping both water sheets, infilling hollows with exploited sediments,
- repairing banks by enrockment in order that better hydrodynamics can be ensured
- deepening and enlarging communication channels between the lagoons and sea (Khairreddine and Radès channels).

Improvement of the water quality concerns salinity, dissolved oxygen saturation percentage, pH, as well as trophic parameters like phosphorus and chlorophyll volume.

In spite of this fact there are signals of permanently localized pollution in the Gulf of Tunis. These comprise thermal pollution drained from the Radès power plants as well as strong water turbidity. From the biological point of view the study zone is a subject of invasion species that can disturb the ecosystem balance. These ingresses are most likely supported by intensive port operation in the sector (ballast waters, biological pollution, etc.).

Immediate environment of the La Goulette-Radès complex is characterized by the following factors and the main pressures:

- the study zone is provided for an intensive industrial-port activity
- residential zones are distant from the port zones
- there are almost no tourist activities in the south of the La Goulette-Radès complex, while the northern zone is one of the most visited parts from this point of view
- fishing is a very developed activity practiced along the seashore, and at the mouth to the sea as well
- the ground disposal zones are localized inside the public navy area

Soils are formed by alluvial formations and they are fully artificialized (transformed) and they represent a limestone texture with dominance of gravels (pebbles). Under influence of sea these lands became halomorphous and they are enriched with salt. This salinity can be observed through abundance of vegetative halophile species.

The newly built tourist and commercial terminal with its capacity of BRT 1100 comprises both a new port pier (a concrete structure on piles, its subsequent lining and paving) and a background of the tourist zone created here – (customs and passport control, shops, restaurants, bars, etc.). The port complex is situated in the Gulf of Tunis, at the northern end of the navigation channel connecting it with the Tunis port that at present is out of operation. The newly built tourist and commercial terminal is freely connected to the present loading port and in principle it solves the tourist and commercial terminal for the town of Tunis.

The core of the project is widening of the port pier by building a pile field in the grid of 7.2 x 5 m (pile length 28 m), in the area of 657.3 x 22.6 m, with subsequent erection of concrete structures, by monolithing with a ferroconcrete slab, then surfacing by means of waterproofing, protecting screeds, paving and cladding. The present bank is treated with a geotextile in the area of 657.3 x 10.5 m, sand fillings, with a subsequent stabilization and a final surface finish with pavement.

The development of economic activities in this former industrial zone will contribute to a sustainable development of the mentioned region. In connection with the economic growth of this area the old ecological loads will be removed and the present environmental impacts on the bay will be decreased.

For execution of this export project the Czech company PSJ, a.s., Jihlava, utilizes a credit of the Czech government. Therefore, in compliance with the obligations of CR to OECD, according to them this construction is classified in the strictest monitored A category, the Czech experts authorized by the Tunisian party prepared the EIA study and questions were formulated concerning details of this study and subsequently terms and conditions were submitted for realization of the construction and reconstruction of the port in La Goulette.

The inquiries dealt namely with harmony of the project with valid master development plans and protection solution of the sea fauna.

The aim of the local investigation was to verify how the conclusion of the EIA study authorization and observance of the subsequent conditioning actions have been met. During this investigation no circumstances occurred that could have a substantial impact, both as for the formal and the matter-of-fact point of view, on the following parts of environment in the area of the intention implementation as well as its immediate vicinity:

- population, including social-economic impacts,
- air and climate,
- noise situation,
- surface and ground waters,
- soil,
- fauna, flora and ecosystems,
- landscape,
- tangible assets and cultural monuments.

The conditions were set first of all for technology of the sea bed scraping in the La Goulette-Radès port complex (extraction of 1,982,000 cubic meters of sediments) and depositing them in the nearby dry lagoon. Monitoring during construction, quality of extracted sediments and a way of their deposition in the lagoon were set as a determining condition of the building progress.

For deposition the following conditions were set:

- deposition of materials coming from the demolished harbor and the structure coming under competence of the Tunisian company for electricity and gas utilization to the offshore disposal area in a given place;
- planning of excavation works for a suitable season with regard to biological and ecological particularities of deposits (reproduction period of sea and especially terrestrial fauna, period and migration route, etc.);
- quality monitoring of waters penetrating from the excavated sediments at the offshore disposal area, their security according to the valid rules.

An increased attention was also paid to excavation, loading and depositing of the excavated sediments from the sea bed with regard to the requirements formulated in the authorization. Based on the preliminary analyses carried out before the beginning of the excavation works in the intended realization place no overlimit concentrations of the risk substances were found out. The sediments situated in the east of the Radès port were a subject of the test holes samples at several places during the years 2002 to 2007. The sediment quality at these places was very good and it does not signal any excess of permissibility criteria for draining to sea.

For depositing of the excavated sediments a locality near the site was selected, evaluated and approved by the Tunisian National Agency for Environment Protection. The locality where the excavated sediments are deposited is in possession of the Commercial Navy and Ports Office.

This locality is determined as a final disposal area and no subsequent handling is supposed. After subsequent adaptation the lagoon with the seal sediment landfill will be used as a parking area.

Monitoring was in progress during all the construction period. By local investigation at the site locality and the disposal area no facts were found out that could imply, from the ecological characteristics point of view, worsening or even stoppage of a possibility to extend excavation works as well as disposal of sediments to the given locality.

A repeated monitoring on the construction project site as well as in its background proved fulfillment of all the set conditions in the sense of the EIA expertise in the scope of the OECD requirements.

At present the port complex with the tourist and commercial terminal has already been completed and prepared for operation.

Environment element	It conforms	It does not conform	Not evaluated	Remarks
Impacts on population, including social-economic impacts	yes, with a condition			By development of economic activities to contribute to the sustainable development of the given region and in connection with the economic growth to reach decrease in the present negative environmental impacts on the bay.
Impact on air and climate	yes			The reviewed activity will not contribute to the environment load with negative impacts on air and climate.
Impacts on noise situation	yes			
Impacts on surface and ground waters	yes, with a condition			By development of economic activities to contribute to sustainable development of the given region and in connection the economic growth to reach decrease in the present negative environmental impacts on the bay.
Impacts on soil			not evaluated	In the given context it is insignificant.
Impacts on rock environment and natural resources	with reservation			Extra attention shall be paid to disposal of excavated deposits from the bay, ensure monitoring of a possible toxic substances leakage.

Impacts on fauna, flora and ecosystems	yes			
Impacts on landscape	yes			
Impacts on tangible property and cultural monuments	yes			With regard to the intention characteristics the implementation of the intention does not appear as risk as for remarkable culture-historical values in the vicinity
Total evaluation	Yes, with the above mentioned conditions concerning the economic support of the sustainable development in the given region and extra caution in handling the excavated sediments from the sea bed (there is a condition of the permanent monitoring of the possible leakage of toxic substances) is the implementation of the intention environmentally acceptable.			See the above mentioned conditions.

With fulfillment of the given conditions and parameters of the intention realization of the export construction project at the La Goulette port in Tunis is acceptable from the environment impact point of view.