Lake Manzala Engineered Wetland

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Egypt
Egypt is facing water scarcity problem with a limitation of water resources and the increase of the demand with the increase of the population (~2%).

Total water resources are almost limited to its share in the Nile (55.5 billion m3/year). Since this treaty, population increased four times. Water resources deceased to around 600 m3/capita/year, which is under water poverty level.

To fill the gap between supply and demand, the country is considering the re-use of drainage and treated sewage water. All strategic studies consider more dependence on drainage and municipal and industrial treated water.

Total municipal and industrial wastewater is around 6.0 billion m3/year. In Egypt, sewage collection networks cover only 40% of rural areas. Part of this has only primary treatment and many of the sewage in the rest goes to different water courses.
Introduction

- As a developing country, the treatment investment is another constraint. So, we should search about a new technique that fit with these conditions.
- Wetlands in a new introduced technique that could give good treatment results, while fitting with limited economic resources.
- The technique might have some limitation in old lands in Egypt (Valley & Delta) regarding the required area for such wetlands.
The project was implemented by Egypt’s Ministry of Environmental Affairs with a contribution of UNDP, then it was handed over as a fully operating facility to the Ministry of Water Resources and Irrigation.

Following treatment, the majority of the water is used for irrigation and agriculture, while some is diverted into basins designed for fish farming.
Lake Manzala Engineered wetland was constructed at the inlet of El-Manzala drain, which get its water Bahr El-Baqr drain.

Bahr El-Baqr is one of the most polluted drains in Egypt.

Total flow to the wetland in 25,000 m3/day.
Manzala Engineered Wetland
Description

- The wetland is constructed from three main parts
  - Sedimentation basins
  - Surface flow beds
  - Subsurface Flow beds
- The project also has five fish farms for the use of the treated water
Manzala Engineered Wetland

Description

- The project includes complete M&E programme with a laboratory for regular measurement of water quality before and after treatment.
- The project also includes building capacity of different researchers.
The treatment level was considerably high.

- It exceeded 60% removal efficiency of BOD,
- 80% of TSS,
- 50% of TN,
- 99% of FC

The system costs just 10 percent of traditional, chemical-intensive wastewater treatment systems.
The project provides the local community with the following:

- In the project local area, fish growth rates have improved by 50 percent because of the reduced BOD, while the economic efficiency of fisheries has improved because of the reduced need to replace water in ponds.

- The project also provides local livelihoods through support services, such as plant harvesting, seedlings propagation, production of fuel and animal feed pellets from harvested biomass; and harvesting of aquatic plants from the wetlands.
This work was operated and monitored by Nation Water Research Center representing ministry of irrigation

Now, we are developing a proposal to apply wetland technique in smaller sizes with the contribution of local communities.

The idea is to develop such wetland in some villages even in some areas in the borders of canals and drains to collect the sewage that are thrown illegally to these water courses.
The work should contain developing water quality map for the study area with two purposes:

- Define the save areas to mix the drainage water (the areas where sewage and industrial effluent don’t mix yet, or mixed with acceptable amount with agricultural drainage water)
- Improving the capacities of these local communities that will share in such work.