FACULTY OF ENGINEERING
IRRIGATION AND HYDRAULICS DEPARTMENT

ENVIRONMENTAL MITIGATION OF WETLANDS IN EGYPT

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Civil Engineering

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DEDICATION

This work is dedicated to who suffered to educate, prepare, build capacity and help

TO
MY FATHER SOUL
And
MOTHER

Also thanks

TO MY SIBLING

STATEMENT

This dissertation is submitted to Ain Shams University for partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Civil Engineering

The work included in this thesis was carried out by the author in the Irrigation and Hydraulics Department, Ain Shams University.

No part of this thesis has been submitted for a degree or a qualification at any other university or institution.

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Thesis: Environmental Mitigation of Wetlands in Egypt

Abstract

In terms of the importance of preserving the aquatic ecosystem of wetlands in Egypt and the Aquatic resource Functions with preserving the Services, this research was initiated with this objective through the numerically investigating the Borollos Lake water quality that deteriorated due to the huge of discharging the wastewater in order to enhance its quality. Primarily, the available measured data was collected in order to visualize a complete data picture the lake, and also, filed visits were carried out; Literature was assembled and reviewed, from which A double standard approach was implemented, where model investigations, for water quality hydrodynamics, were achieved by SMS12.1.7 (SMS-TABS). A model for simulating the hydrodynamic conditions and water quality within the lake has proved to be a good and effective model for this purpose and has proved its good ability to simulate the conditions inside the lake, which has enabled the use of several scenarios to restore the ecosystem of El-Borollos lake and propose different scenarios to improve the quality of the lake until the lake recovers its ecosystem , The results of water quality readings, and the environmental impact assessment of these scenarios through the implementation of the RIAM matrix, the recommended scenario was a scenario of adding a new connects channel between the lake and the Mediterranean with the treatment of southern banks, In addition, the research provided various engineering solutions that contribute to maintaining the quality of water and restoring the lake's environmental and water system by controlling the deterioration of water quality and also the possibility of implementing the recommended solutions in the form of General in lakes and other wetlands in Egypt.

The study concludes with the following recommendations:
• The importance of the treatment of southern drains before pouring in the lake.
• The importance of the widening and dredging of the old Bughaz because of its positive impact in improving the salinity level in addition to, it is improve the exchange of water currents between the lake and the Mediterranean Sea.
• The importance of establishing a new channel linking the lake to the subject of study and the Mediterranean Sea in the western region.
• The thesis concluded the relationship between the calculation of the water depth and concentration of organic matter and also between them and the different temperatures.
• It is necessary to apply the RIAM matrix before and during the implementation of the proposed solution to identify the weak points and negative points with finding solutions and also to clarify the negative effects on the environment.

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