

**RESTORATION AND MANAGEMENT OF THE
ECOSYSTEM SERVICES OF BURULLUS LAKE - EGYPT**

**Submitted by
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B.Sc. Civil Engineering, Faculty of Engineering, Ain Shams University, 2003
Diploma in Environmental Sciences, Institute of Environmental Studies & Research,
Ain Shams University, 2013

A thesis submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Engineering Sciences

Department of Environmental Engineering Sciences
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APPROVAL SHEET
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ABSTRACT

Burullus wetland is the second-largest Egyptian Northern lagoons, located in the central part of the Nile Delta. It comprises one of the most unique and productive habitats in the Mediterranean region and plays an important breeding and sheltering role for many wildlife, water birds and plant species, including number of rare and threatened species. Thus, the wetland was declared as a nature reserve under the international Ramsar convention, important bird area (IBA). Besides, the wetland is considered a part of a national protectorate that was declared in 1998.

This study focuses on the wetland and its five districts, as it offers various ecosystem services including provisional, regulating, supporting and recreational, supporting income and livelihood of local communities surrounding the wetland.

However, the wetland is recently under pressure of several socio-economic drivers including rapid population growth, unplanned urbanization and a conflict of various economic activities around the wetland as; fishing, aquaculture, agriculture, salt extraction, bird hunting and reed harvesting, in addition to climate change threats. Such drivers are posing serious implication on the wetland ecosystem, affecting directly and/ or indirectly its health and productivity. Thus, distressing local communities who rely on its services to support their income and livelihood.

This thesis aims to develop and test integrated tools for assessment, valuation and management of Burullus wetland, applying recent international approaches for valuation and wise use of wetlands ecosystem services. Several field visits was conducted to a number of selected villages of the districts surrounding Burullus wetland for direct communicating with relevant stakeholders, local communities and different targeted groups. Socio-economic and gender analysis data were collected using designed questionnaires, to identify main ecosystem services and goods provided by Burullus wetland that have direct and indirect influence on the household income of local communities. Direct and indirect economic valuation of provisioning ecosystem services (fishing – agriculture – reed harvesting – salt extraction - bird hunting), through estimation of the total cost for each activity (capital - operational – labors fees) and their direct return through a specified questionnaires for each services.

Gender equity was one of the main target of this thesis, where interviews have been conducted with women and children in selected villages with a detail

analysis of the main reasons of weak participation of women in economic activities.

Allocation model has been prepared for maximizing the total return of selected provisional activities and main crops in the agricultural area. DPSIR framework was applied for identifying main pressures resulted from the current drivers and its impact on the efficiency of the wetland ecosystem services. Finally, management and restoration plan was prepared as responses needed to mitigate negative impacts exerted on the wetland ecosystem services from current anthropogenic drivers.

The results of this thesis are recommended to be adopted by relevant stakeholders as a model to guide decision makers in managing and restoring other Egyptian Northern wetlands.

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