بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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بالرسالة صفحات لم ترد بالاصل

AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
IRRIGATION AND HYDRAULICS DEPARTMENT

CONTAMINANTS DIFFUSION FROM IRRIGATION WATER MANAGED BY OPTIMIZATION TECHNIQUE

By
Ayman Abd El-Sattar Mokhtar Ahmed Nassar
(M.Sc. Civil Engineer - Ain Shams University)

A thesis submitted for
the fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY
in CIVIL ENGINEERING

Supervised by

Prof. Dr. Mohammed El-Niazi Hammad
Irrigation and Hydraulics Dept.,
Faculty of Engineering, Ain Shams University, Cairo, Egypt

Prof. Dr. Ali Mohammed Talaat
Irrigation and Hydraulics Dept.,
Faculty of Engineering, Ain Shams University, Cairo, Egypt

Prof. Dr. Mohammed Mohammed Nour El-Din
Irrigation and Hydraulics Dept.,
Faculty of Engineering, Ain Shams University, Cairo, Egypt

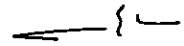
Cairo, Egypt
2000

EXAMINERS COMMITTEE

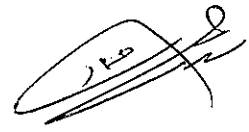
Signature

Prof. Dr. Tahany Fahim Youssef
Irrigation and Hydraulics
Faculty of Engineering - Helwan University

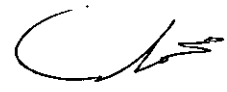
Prof. Dr. Sameh Dawood Armanious
Irrigation and Hydraulics Dept.
Faculty of Engineering - Ain Shams University



Prof. Dr. Mohammed El-Niazi Hammad
Irrigation and Hydraulics Dept.
Faculty of Engineering - Ain Shams University



Prof. Dr. Mohammed Mohammed Nour El-Din
Irrigation and Hydraulics Dept.
Faculty of Engineering - Ain Shams University



Date: 22/3/2000

STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Doctor of Philosophy in Civil Engineering, Irrigation and Hydraulics.

The work included in this thesis was carried out by the author in the Faculty of Engineering, Ain Shams University, Cairo, Egypt and Leichtweiss Institut für Wasserbau (LWI), Technischen Universität Carolo-Wilhelmina zu Braunschweig, Germany.

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

Reprints from this thesis may be made on conditions that the full title of the thesis, name of author, page reference and the date of publication are given.

Date: / / 2000

Name: Ayman A. Nassar

Signature:

ACKNOWLEDGMENTS

My special appreciation and thanks to Prof. Dr. Ing. Ulrich Maniak, Leichtweiss Institut für Wasserbau, TU Braunschweig for his valuable support, positive critics and his advice throughout this work.

I am deeply grateful to Prof. Dr. Mohammed El-Niazi Hammad, Faculty of Engineering, Ain Shams University for his kind guidance and useful suggestions.

I wish to express my deep gratitude to Prof. Dr. Ali Mohammed Talaat and Prof. Dr. Mohammed Nour El-Din, Faculty of Engineering, Ain Shams University for their cooperation and help.

Special acknowledgments are extended to both of Dipl.-Ing. Dieter Seeger and Dipl. Geogr. Gerhard Riedel, Leichtweiss Institut für Wasserbau, TU Braunschweig for their generous cooperation.

I am deeply thankful to Dr. Michael R. Bussieck and Dipl.-Math. Thomas Lindner, Institut für Angewandte Mathematik, TU Braunschweig who devoted their time and effort through performance of this work.

I am very grateful to Prof. Dr. Ahmed Dardir, EMISAL company for providing the necessary facilities during the field investigations. This work would be probably not completed in this form without his support and help.

Special thanks for Prof. Dr. S. Emara, Assiyut University, Mr. Khairy Fergany, Fayoum Governorate, Eng. Samir Yaacob, Irrigation Ministry and Mrs Ragaa Hussein, Fayoum Irrigation Dept. for their cooperation.
I would like also to thank every one help me or advise me especially my parents for their sacrifices and moral support.

Ayman A. Nassar

VITA

Name:	Ayman Abd El-Sattar Mokhtar Ahmed Nassar
Date of Birth:	02.02.1970
Place of Birth:	Cairo, Egypt
Present Position:	Assistant Lecturer, Irrigation and Hydraulics Department, Faculty of Engineering, Ain Shams University, Egypt.

Education:

09.1975-06.1980	Primary School
09.1980-06.1983	Preparatory School
09.1983-07.1986	Secondary School

Degrees Awarded:

09.1986-06.1991	B.Sc. in Civil Engineering, Faculty of Engineering, Ain Shams University
10.1991-10.1994	M.Sc. in Civil Engineering, Faculty of Engineering, Ain Shams University

Date: / / 2000

Name: Ayman A. Nassar

Signature:

ABSTRACT

This study is motivated by the increase of the water salinity in Qaroun lake and the soil salinity in Fayoum basin. Fayoum basin is an agricultural land receives its water from the Nile river. The actual crops in Fayoum suffer from water stress due to the poor consonance between the water supply and the crops requirements. The Fayoum drainage water flows to Qaroun lake and Wadi Rayan lakes where it evaporates leaving salts. The high water salinity reduced the fishing and the tourism activities in the basin. The non controlled drainage water increases the lake water level causing soil problems. Wadi Rayan lakes are used recently as bypass to deliver a suitable water volume to Qaroun lake. The rest drainage water flows to wadi Rayan lakes.

This study comprises a comprehensive simulation of water and salts behavior through a development of a numerical optimization model. The used optimization technique is linear programming, which determines the absolute optimum solution and not a local one.

The present work aims to determine a suitable crops distribution in Fayoum basin to result a specified drainage water distribution. This drainage water results minimum salt load and allowable water levels in Qaroun and Wadi Rayan lakes. Two different cases are studied considering the water supply. The maximum and minimum capacities of the water channels are concerned.

The system is described and discussed including the different parameters in chapter two. The problems are analyzed with the previous solutions in chapter three. The theoretical approach is estimated in chapter four. Chapter five describes and formulates the developed model. The results are analyzed and verified in chapter six.

KEY WORDS:

Fayoum - Optimization - Qaroun - Water Balance - Salt Balance

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