



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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MONA MAGHRABY



**Ain Shams University
Faculty of Engineering**

***IMPROVING EFFICIENCY OF OPEN
CHANNEL BY REHABILITATING THE MOST
EFFECTIVE REACHES***

By:

Ahmed Ageeb Tawfik Abbas

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Supervised by

Prof. Dr. Nahla M. Abdelhamid AboulAtta

Professor of Irrigation Design
Irrigation & Hydraulics Department
Faculty of Engineering
Ain Shams University

Prof. Dr. Ghada Mahmoud Samy

Professor of Hydraulics
Irrigation & Hydraulics Department
Faculty of Engineering
Ain Shams University

Assoc. Prof. Dr. Mohamed Salah Abd-AlMoaaty

Associate Professor
Channel Maintenance Research Institute (CMRI)
National Water Research Center (NWRC)

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Abstract

The process of saving and managing water distribution for irrigation networks system are one of the most critical tasks, which Ministry of Water Resources and Irrigation (MWRI) is interested in. Managing water distribution depends mainly on three major axes, which are; the required discharge (Q), hydraulic cross section carrying the required discharge, and water levels at branch canals intakes to achieve the required demands. The irrigation network in Egypt suffers from several hydraulic issues such as changing in canal geometry (scouring and siltation) which may have occurred due to faulty design or insufficient maintenance programs.

Al-Rayah Al-Tawfiky is selected for conducting this research. Al-Rayah Al-Tawfiky is a part of Damietta branch on Nile River. It is very essential to irrigation process in Delta as it passes through three governorates (El-Qalyobia, El-Dakahlia and Damietta, Ends at El Manzala Lake). The total length of Al-Rayah Al-Tawfiky is 175 Km, however, this research is carried out on a reach of 37 km length (from inlet regulator to Jamjra regulator at km 37.00) with average bed width of 52 m.

The main objectives of this research are: determine the reaches of the canal, which need rehabilitation, based on the analysis of actual collected data; to deduce an empirical equation relating the hydraulic parameters, and to illustrate the hydraulic effects of rehabilitating the most effective reaches on the hydraulic performance of Al-Rayah Al-Tawfiky. For this purpose, different rehabilitation scenarios were simulated using SOBEK1D model. The results for each scenario take into consideration water levels, velocities, and discharge at different locations along Al-Rayah Al-Tawfiky.

An economic study was carried out to clarify the benefit from implementing the suggested rehabilitation works, besides comparing the economic income, and the rehabilitation costs.

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