شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

Minoufiya University
Faculty of Engineering
Civil Engineering Department

EVALUATION AND MODERNIZATION OF IRRIGATION DELIVERY SYSTEMS IN THE OLD LANDS

A Thesis Submitted by

Eng. Evelin Shafik Yassa Gergis
B.Sc. in Civil Engineering 1977 Alexandria University
M.Sc. In Civil Engineering 1995 Menoufiya University

For the Award of the Degree of

Ph.D. in Civil Engineering
Irrigation and Hydraulics
In the Field of Hydraulics

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2003

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STATEMENT

This thesis is submitted to the Department of Civil Engineering, Faculty of Engineering, Minoufiya University, for the award of the degree of Ph.D.

Thesis Title: **"Evaluation and Modernization of Irrigation Delivery Systems in the Old Lands".**

No part of this thesis has been submitted to any other university or institute for the award of degree or qualification.

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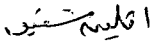
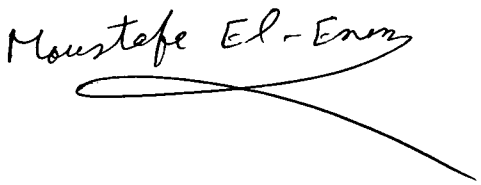
Signature : 

Date : 16/6/2003

The above statement has been signed by the thesis author.

Supervisor



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ABSTRACT

Fast growing of population in Egypt faces agriculture with an increasing demand for its production. The Egyptian water resources is fixed according to the international agreement of 1959. Increasing agricultural production means enhancing the productivity of the cultivated lands and/or bringing new lands to be cultivated. So that, it is a must to maximize irrigation efficiency for water conserving. Ministry of water resources and irrigation (MWRI) has focused on the importance of finding different approaches for increasing water use efficiency and agricultural production.

The objectives of the research are to evaluate the performance of the irrigation distributary systems in the old lands and introduce modernization for the system operation in order to deliver an adequate and dependable supply of water in an equitable and efficient manner to users served by the system.

To carry out the performance analysis, El-Qahwagi canal and Dakalt canal command areas were selected to collect the required data for evaluation analysis. El-Qahwagi canal is operated under continuous flow, while Dakalt canal is operated under rotational flow. A lot of data were collected on the two chosen canals about daily water levels, cross sections, cropping patterns and other relevant data. Performance measures are adequacy, efficiency, dependability and equity. The contributions of management and structural characteristics of the system were discussed for each measure. From the analysis, it is deduced that:

1- For the tradition system,

   a- Adequacy measures during summer months are poor due to management contributions, but there is no structural limitation to deliver adequate delivery. During winter months, the delivery is adequate.

b- Efficiency measures indicate that the system is highly efficient during summer months, but during winter months the system is poor with respect to efficiency.

c. Dependability, uniform flow over time, measures are poor for the canal reaches due to management and structural contributions.

d. Equity measures are poor due to management and structural features of the system.

2- For the improved system,

a- Adequacy measures during summer months are poor for the head reaches, but they are better for the end reach and the canal. Management practices affect adequacy, but no structural limitation to deliver adequate delivery. During winter months, adequacy measures are more than unity.

b- Efficiency measures indicate that during summer months there is an increased compatibility with the goal of efficiency due to management and structural contributions. But during winter months efficiency measures are poor.

c. Dependability measures indicate that there is a need to enhance management practices and structure operation to achieve good performance with respect to dependability.

d. Equity measures indicate that equity is poor due to management practices, but there is no structural limitation to achieve.

The suggested approach, for modernization, is introduced through a mathematical model. The approach concepts are to deliver continuous flow in distributary canals and their branches, rotational flow is lifted to elevated meskas. Water flows from meskas to farms through outlets, which offtake from meskas. Water is lifted to meskas during specific hours, which depend on the season and the preferable hours of irrigation for water users. A computer program is formulated to be used as an easy tool to design and operate the