بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

REMOTE SENSING APPLICATIONS OF THE RAINFALL FORECASTING OVER THE BLUE NILE BASIN

THESIS

SUBMITTED IN PARTIAL FULFILLMENT
FOR MASTER DEGREE IN CIVIL ENGINEERING

BY

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1999

Approval Sheet

THESIS: Remote Sensing Applications of the Rainfall Forecasting over the Blue Nile Basin

BY: Eng. Ibrahim Hamouda El-Sebaie

DEGREE: Master of Science in Civil Engineering-Irrigation and Hydraulics

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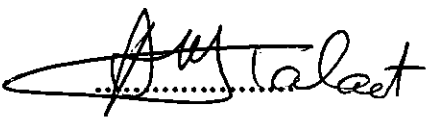

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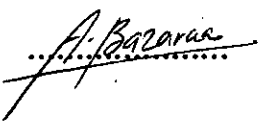

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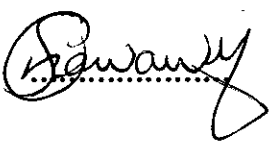

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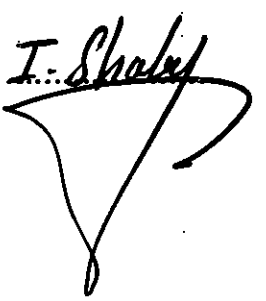

To my family

STATEMENT

The dissertation is submitted to Ain Shams University for the degree of Master of Science in Civil Engineering.

The work included in this thesis was carried out by the author for research purposes only and represents the opinion of the author, which is not official statement.

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

Date : / /1999

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Signature :

ABSTRACT

The ability of producing reliable rainfall estimates is studied using satellite infrared data. These estimates could be used by hydrological models to predict and simulate the flow into High Aswan Dam in Egypt. The Blue Nile Basin, which supplies 85 % of the water that reaches Aswan, has been selected to be the study area. The topography of the selected area influences the storms during the flood period thus causing significant variability of precipitation.

Currently available data from operational meteorological satellites includes information on the temperature of the surface below the satellite and its reflectivity in different parts of the solar spectrum. Also, the principles of most of the current techniques for estimating rainfall from temperature of the cloud tops are to associate rainfall with cold (high) clouds assuming that these are the tops of active storms.

In this study, the satellite images and real time observed data through the meteosat satellite for previous years (1992-1996) July & August (during the flood season) were accumulated. The satellite images were analyzed and processed. Estimates to the amount of rainfall over the Blue Nile Basin on daily basis were obtained by applying different techniques. The validity and reliability of the satellite estimates compared to the measured values were investigated and verified at the available stations located in the Blue Nile Basin and on the average basis.

The results showed that there are some differences between the raingages data and the satellite estimates. Two techniques (Nfs-clim & GPI) gave better results but their estimates vary from month to month and year to year. The overall correlation coefficient between the satellite estimate and the measured mean areal precipitation over the Blue Nile Basin is found to be around 0.60 and it ranges between 0.40 to 0.69 on the individual ground stations

One of these techniques (Nfs-clim) was thus applied to forecast the amount of rainfall over the Blue Nile Basin. It is further recommended to collect more satellite data, incorporate the other kinds of the satellite images for use with the infrared images and integrate more techniques to enhance the reliability of the satellite estimates.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and appreciation to Prof. Osman A. Elnawawy, Irrigation and Hydraulics Department, Faculty of Engineering, Ain-Shams University, for his close guidance and generous support throughout the work.

I am grateful to Prof. Ibrahim Shaker, Department of Survey & Remote Sensing, Faculty of Engineering, Ain-Shams University, for his great cooperation and useful advises throughout the work.

Thanks to Dr. Bayoumi Attia, Head of the Planning Sector, Ministry of Public Works and Water Resources, for his continuos support and giving me the chance to perform this work.

Thanks to Mr. J. Roskar, Hydrometeorological Expert, Nile Forecast Centre, Ministry of Public Works and Water Resources for his excellent guidance and suggestions throughout the work.

Thanks to Ministry of Public Works and Water Resources, which gave me the chance to carry out this study.

I would like to give my special thanks to my wife, Dr. Mervat Talaat, and all my family for their loving support and encouragement throughout the work.