

# بسم الله الرحمن الرحيم





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم





# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

## قسم

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



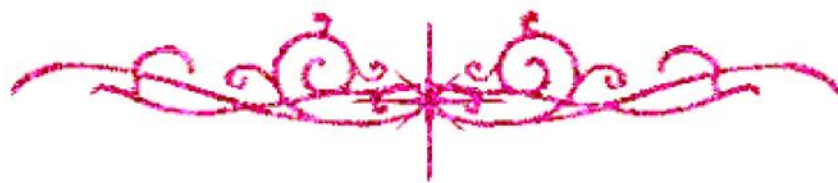
## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار





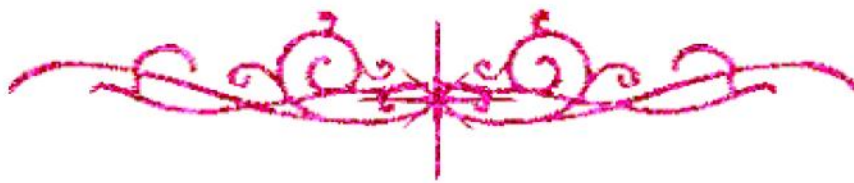
بالرسالة صفحات  
لم ترد بالأصل







# بعض الوثائق الأصلية تالفة



# **STUDY OF THE FAYOUM DEPRESSION BY USING REMOTE SENSING TECHNIQUES FOR SUSTAINABLE DEVELOPMENT**

**A Thesis Submitted in Partial Fulfilment for the Degree of  
Master of Science in Applied Geology (Remote Sensing)**

**BY**

**Mohammed Ali Al-Ebrahim**

**(B. Sc. Applied Geophysics, 1994) Damascus University, Syria  
Geologist/ General Authority for Remote Sensing and Space Sciences,  
Damascus, Syria.**

**TO**


**GEOLOGY DEPARTMENT  
FACULTY OF SCIENCE  
AIN SHAMS UNIVERSITY**

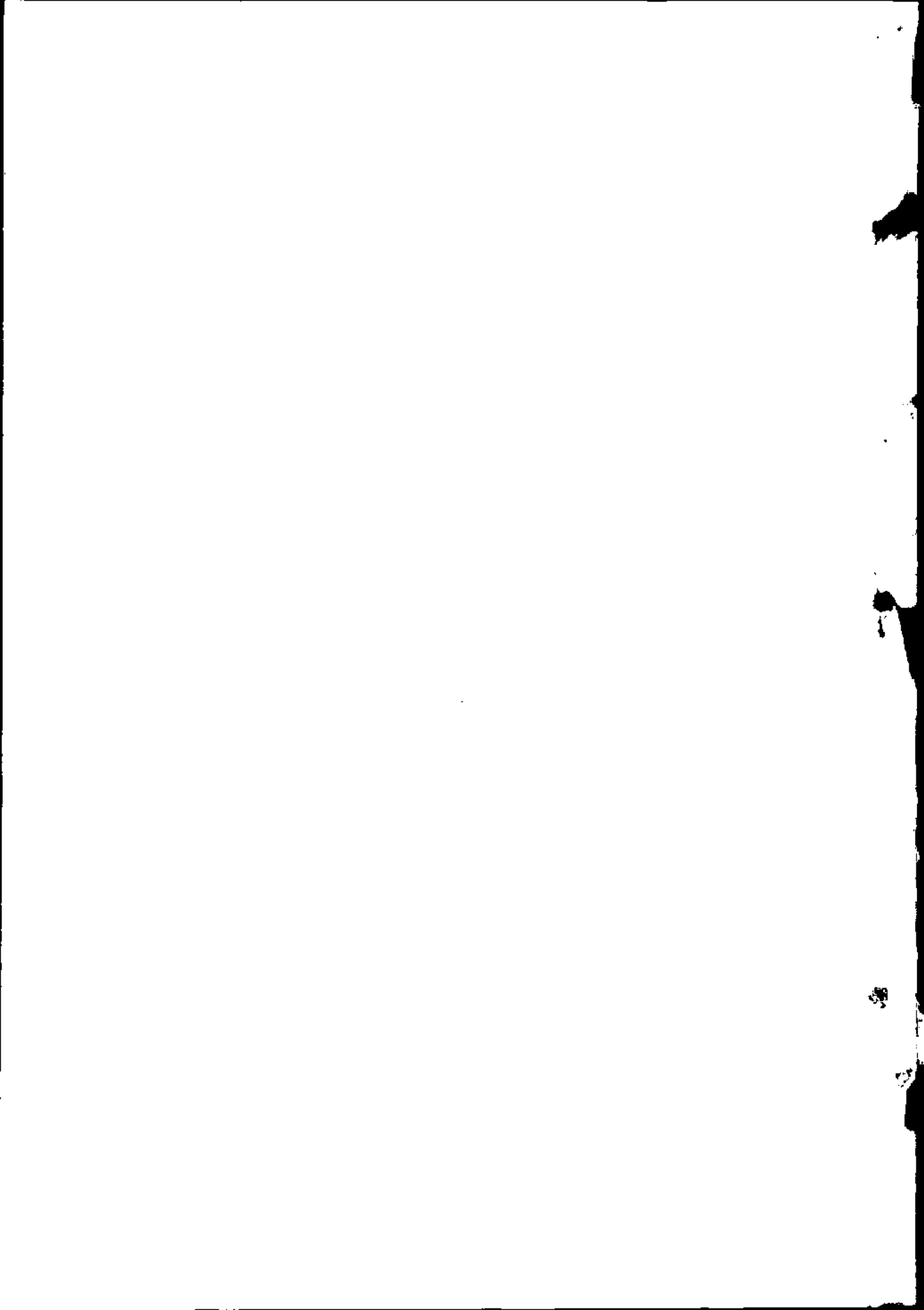
*Advisors*

*Prof. Dr. Hassan A. El-Etr*  
**National Authority for  
Remote Sensing and  
Space Sciences  
Cairo**

*Assist. Prof. Dr. Mahmoud S. Yousif*  
**Geology Department  
Faculty of Science  
Ain Shams University  
Cairo**

  
November, 2000





# **STUDY OF THE FAYOUM DEPRESSION BY USING REMOTE SENSING TECHNIQUES FOR SUSTAINABLE DEVELOPMENT**

**A Thesis Submitted in Partial Fulfilment for the Degree of  
Master of Science in Applied Geology (Remote Sensing)**

**BY  
Mohammed Ali Al-Ebrahim**

**(B. Sc. Applied Geophysics, 1994) Damascus University, Syria  
Geologist/ General Authority for Remote Sensing and Space Sciences,  
Damascus, Syria.**

**TO  
GEOLOGY DEPARTMENT  
FACULTY OF SCIENCE  
AIN SHAMS UNIVERSITY**

## ***Advisors***

***Prof. Dr. Hassan A. El-Etr*  
National Authority for  
Remote Sensing and  
Space Sciences  
Cairo**

***Assist. Prof. Dr. Mahmoud S. Yousif*  
Geology Department  
Faculty of Science  
Ain Shams University  
Cairo**

**November, 2000**





• To my Supervisors

To my Father

To memories of my Mother

To my Brothers

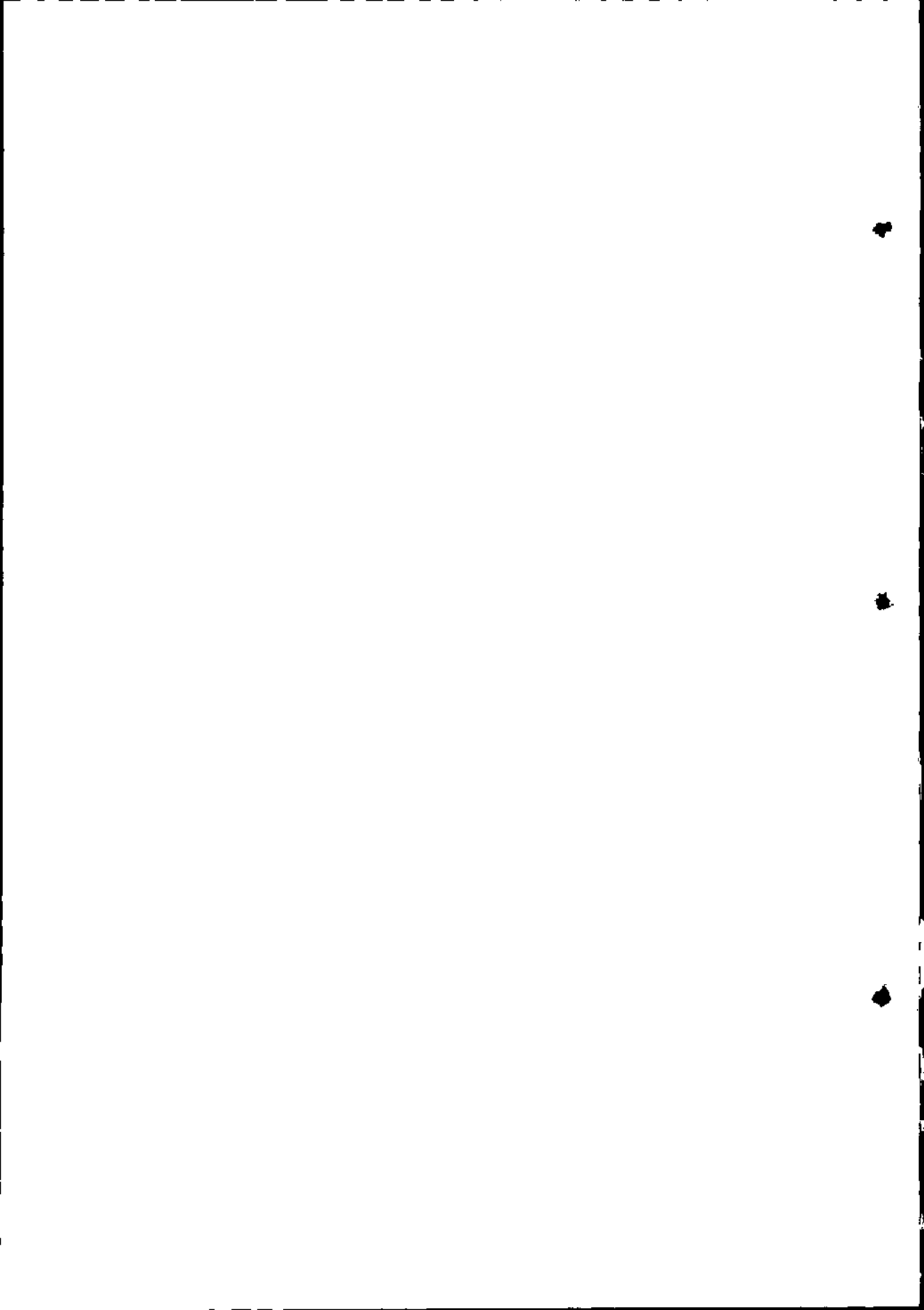
To my Wife

To my Sons

To my Friends

To my Country

**Mohammed Ali Al-Ebrahim**





## **NOTE**

The present thesis is submitted by Mohammed Ali Al Ebrahim to the Faculty of Science, Ain Shams University in partial fulfilment of the requirements for the degree of Master of Science in Applied Geology (Remote Sensing).

Beside the research work materialized in this thesis, the candidate has attended post-graduate courses (Structure Geology Division) for two academic years (1996-1997; and 1997-1998) covering the following topics:

1. Photogeology.
2. Geomorphology.
3. Advanced Lithostratigraphy.
4. Biostratigraphy.
5. Sedimentary Petrology.
6. Sedimentation.
7. Structural Geology.
8. Geotectonics.
9. Field Geology and Mapping.
10. Geostatistics and Basic Language Programming.
11. English Language.

**He has successfully passed the final examinations of these courses in December 1998.**

**Prof. Dr. Samir Ahmed Awad**



**Head of the Geology Department**

**Faculty of Science**

**Ain Shams University**



## ACKNOWLEDGEMENTS

I am deeply thankful to God. The student wishes to express his deep appreciation to the staff members of the Geology Department, who kindly offered available facilities and unfailing help during the progress of the investigation.

The student is greatly indebted to **Dr. Mahmoud Samy Yousif**, Assist., Professor, Geology Department, Faculty of Science, Ain Shams University, for supervising the work, his suggesting the research point, continuous help, useful discussion, valuable advise and critical reading and revising of the manuscript. The author would like to express his deep thanks to **Prof. Hasan El-Etr**, National Authority for Remote Sensing and Space Sciences, for his supervision and guidance.

I would like to express my deepest gratitude to **Dr. Mohammed Al-Hinnawy**, ex-Chairman of Egyptian Geological Survey and Mining Authority (EGSMA) and **Dr. Zeinhom El-Alfy**, the director of the Information Center, for their permission to use the facilities of the GIS laboratory to complete my thesis.

I would like to express my deepest gratitude to **Geologist Abd El Aal Hassan Atia**, EGSMA (GIS lab.). Thanks also are due **Geologist Mohammad Abd Al-Aziz** and all the staff of the Remote Sensing and GIS unit, EGSMA for help and cooperation. Special thanks are extended to my colleagues **Hussein Hamid Hussein** and **Mohamod Melhim** for their help in preparing the manuscript.

I would like to express my deepest gratitude to **Prof. Mohammed Adel Yehia**, Chairman of the National Authority for Remote Sensing and Space Sciences, for permission to train at the Authority.

Thanks are due **Geologist Yousry Abd Alaal**, for helping in field work. Deep thanks to **Miss Nihad Al Nojoumy** (Customers Support, ERSS Co.) for helping in this research.

My sincere thanks are extended to **Prof. Samir Awad**, Head of the Geology Department, Faculty of Science, Ain Shams University.

Last but not the least; I am thankful to my father for his support, and I am also thankful to my wife and my twin sons for their support, continuous encouragement and their standing beside me in preparing this thesis.



