MONITORING VEGETATION COVER CHANGE IN EASTERN NILE BASIN USING REMOTE SENSING

By

Mohammed Salah Yousef Marzouk

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE
In
IRRIGATION AND HYDRAULICS ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

Prof. Dr. Ahmad Wagdy Abdeldayem

……..

Professor of Hydrology
Irrigation and Hydraulics Department
Faculty of Engineering, Cairo University

Prof. Dr. Nadia Mohamed Eshra

……..

Associate Professor of Hydropower
National Water Research Center
Ministry of Water Resources and Irrigation,
Cairo, Egypt

Dr. Mohamed Aly Elkordy

……

Assistant Professor
Irrigation and Hydraulics Department
Faculty of Engineering, Cairo University

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Approved by the
Examining Committee

_____
Prof. Dr. Ahmad Wagdy Abdeldayem, Thesis Main Advisor
Professor of Hydrology
Faculty of Engineering, Cairo University

_____
Prof. Dr. Alaa El-Din Mohamed El Zawahry, **Internal Examiner**
Professor of Water Resources
Faculty of Engineering, Cairo University

_____
Prof. Ashraf Mohamed Elmoustafa, External Examiner
Professor of Engineering Hydrology
Faculty of Engineering, Ain Shams University

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2020

Engineer's Name:	Mohammed Salah Yousef Marzouk
Date of Birth:	13/10/1990
Nationality:	Egyptian
E-mail:	mohammedsalahyousef@gmail.com
Phone:	01004855836
Address:	22 a.b.c Gameaa El Ismaili, khayrat, Lazoughly, Cairo, Egypt
Registration Date:	01 / 03 / 2014
Awarding Date:	… / … / 2020
Degree:	Master of Science
Department:	Irrigation and Hydraulics Engineering

Supervisors:

Prof. Ahmad Wagdy Abdeldayem

Associate Prof. Nadia Mohamed Abdelsalam Eshra

Dr. Mohamed Aly Elkordy

Examiners:

Prof. Dr. Ahmad Wagdy, (Thesis main advisor)
Prof. Dr. Alaa Elzawahry, (Internal Examiner)
Prof. Ashraf Mohamed Elmoustafa, (External Examiner)
- Professor of Engineering Hydrology,
  Faculty of Engineering, Ain Shams University

Title of Thesis:

Monitoring vegetation cover change in the Eastern Nile using remote sensing

Key Words:

Eastern Nile; Vegetation Cover Change Detection; Evapotranspiration; GERD Dam; Remote Sensing

Summary:

As a result of this research, a technique is now made available to continuously monitor the dynamic changes in the green cover within the Eastern Nile basin. The monitored irrigated land areas in dry and wet seasons are used to calculate the water consumption based on provided actual evapotranspiration and interception data. The technique aims at producing consistent spatial and temporal maps for green cover in the Eastern Nile in both seasons (wet and dry) using available remote sensing data. Several remote sensing indices (water and vegetation) are tested to determine their applicability in detecting the green cover changes. Among these indices, the Normalized Difference Vegetation Index is chosen to map the green cover and giving a unique pattern for every land use upon analyzing the time series results. The method has been applied on Sudan main irrigation schemes (Gezeira- Rahad – Kenana) and the time series vegetation cover maps are generated for the study areas over the period from 2000 till 2016. The resulted classification maps were compared to the FAO classification maps generated at the Wapor project, and the results prove to be consistent and water consumption is calculated accordingly.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Mohammed Salah Yousef Marzouk Date:

Signature

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Mohammed Salah Yousef, 2020

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