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Assessment of Agriculture Developments Projects in Nile Basin in Sudan, Using Remote Sensing

A Thesis
Submitted in Partial Fulfillment of the Requirement for the Degree of
MASTER OF SCIENCE IN CIVIL ENGINEERING

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Statement

This thesis is submitted to Ain Shams University for the degree of Msc. degree. in Civil Engineering.

The work included in this thesis was carried out by the author at the Department of Irrigation and Hydraulics, Faculty of Engineering, Ain Shams University, Cairo, Egypt.

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Abstract

The development strategies for the Nile basin countries include increasing intensity of agricultural productivity through large extent planned agriculture projects. The increase activities in agriculture increase the need to obtain information and to derive monitoring systems to evaluate the progress of these projects.

The monitoring and assessment process for agriculture projects very complicated as it requires series of processes involving data collection, data analysis. Therefore, the demand of opportune is a dominant element concealed agriculture data and relevant monitoring.

Remote sensing significantly can help developing a well-timed and credible image of the agricultural sector. And also it is very convenient for collecting data over enormous areas with immense re-visit recurrence. The use of remote sensing techniques became a power tool to analyzing that data along with data gathered using common field approaches helping to overcome conventional data size restraint. Remote sensing can also simplify the monitoring development of agriculture projects and thereby support decision makers.

The main objective of the study is to develop an assessment and monitoring methodology for developments in agricultural projects. This will be applied to the Nile Basin countries as a study area through the development of GIS-based system used to compute water and agriculture spatial indicators using remote sensing, in order to help decision makers to choose the most appropriate development plans.

The Water Resources Agriculture Spatial Indicators System (WRASIS) was developed to deal with several types and formats of satellite images, and apply automatic geographical and mathematical corrections. WRASIS also applies mathematical calculations using time series images. It also apply mathematical calculations to estimate the cultivated areas ,average and total rainfall, then storing output indicators in a suitable database.

The study was carried out on four projects in the Nile basin in Sudan:

- New Halfa project in the Sub-Atbara basin.
- Guneid project in the Blue Nile basin.
- Assalaya and White Nile Sugar projects in the White Nile sub-basin.

These projects were considered to be chosen within three different sub-basins with different geographical extent, climatic conditions and agricultural seasons to measure the accuracy of application in calculating these indicators.

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