شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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Economic Based Investment Planning for Integrated Water Resources Management

A Thesis submitted in partial fulfillment of the requirements of the degree of Doctor of Philosophy in Civil Engineering
(Irrigation and Hydraulics)

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STATEMENT

This dissertation is submitted to Ain Shams University for partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Civil Engineering.

The author carried out the work included in this thesis, and no part of it has been submitted for a degree or a qualification at any other scientific entity.

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ABSTRACT

A computer-based water Resources Management utility named Integrated Water resources Management Decision Support System (IWRM-DSS) is developed in the present study. It is intended to provide a comprehensive analysis and management tool for water resources allocation and distribution. IWRM-DSS tackles three main applications in the field of Integrated Water Resources Management (IWRM), which are (water accounting/management), (water allocation), and (investment prioritization).

The first application provides a comprehensive analysis of the existing Water Cycle Balance, identifying the gaps, and set a Decision Support System (DSS) for optimal Water Resources Management. The model reflects the widely articulated demand for a holistic assessment that considers the possible benefits of greater inter-sectorial regulation, cooperation, coordination and cost-sharing, as well as an increasingly commercialised approach to water sector service delivery as populations continue to grow, the economy continues to grow, and water becomes more scarce to demand.

The second application develops an integrated water allocation master plan with a corresponding investment plan based on the National Water Resources Plan (NWRP) and Joint Integrated Sector Approach (JISA) platform. This will include identifying information sources, defining harmonised standards for data collection, elaborating operational protocols for data processing, and sharing, and delivering at least three "start-to-finish" Water Modeling operations.

The third application assists in drafting a financial roadmap with different scenarios; Drafting business plans and models, subsidies reduction and other options to enable the achievement of financial sustainability and prioritising the water sector investment according to the availability of the national budget.

Key words: Adaptive Water Management, Integrated Water Resources Management (IWRM), Optimization, Genetic Algorithms (GA), Geographic Information Systems (GIS), Water Decision Support Systems (W-DSS), Water Economics, Water Resources Cycle Balance, Virtual Water, Benchmarking, Socio-Economic Development, National Water Resources Plan (NWRP).

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