



NILE BASIN

The Nile Basin Initiative (NBI) is a partnership initiated and led by the riparian states of the Nile River through the Council of Ministers of Water Affairs of the Nile Basin states (Nile Council of Ministers, or Nile- COM).

The NBI seeks to develop the river in a cooperative manner, share substantial socioeconomic benefits, and promote regional peace and security.

The NBI started with a participatory process of dialogue among the riparians that resulted in their agreement on a shared vision:

“to achieve sustainable socioeconomic development through the equitable utilization of, and benefit from, the common Nile Basin water resources”



NBDSS Technical Support

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Nile Basin Initiative Secretariat Water Resource Management Department

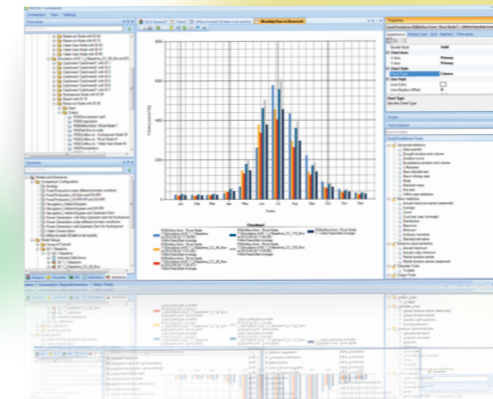
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NB DSS - Nile Basin Decision Support System

The Nile Basin Decision Support System (NB DSS) is software framework jointly developed by the Nile Riparian states for communication, information management and analysis of water resources. It provides a platform for sharing knowledge, understanding river system behaviour, evaluating alternative development and management strategies, and supporting informed and knowledge-based, scientific decision making

Water Resources Planning – a complex task:

Today, more than ever before, water resources planners are required to address increasingly complex issues. They need to meet competing water demands, such as for irrigation, power generation, maintenance of environmental flows, urban and industrial water supply. All these demands have to be met without compromising the needs of future generations.

In transboundary river basins, the complexity is even more pronounced - water demand in all riparian countries have to be met in a transparent way to build confidence and promote joint/cooperative development.

Uncertainties about future climate have added a new dimension to the complexity of water resources planning.

Thus, water resources planning is becoming a scientific and multidisciplinary exercise, requiring professionals of different disciplines to collaborate

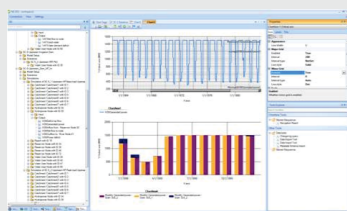
NB DSS - a comprehensive analytic framework:

The Nile Basin DSS is designed to meet the requirements of complex water resources planning. It provides diverse toolsets for data processing, modeling, scenario management, optimization and multi-criteria decision making. It offers tools for integrating environmental, social and economic objectives thus greatly facilitating multi-sector water resources planning at river basin level.

The DSS is a generic system that can be applied at different scales – at national as well as transboundary levels. It can be installed both within an institutional setup, thereby allowing multiple access to its central database and toolset, and also as a standalone solution.

KEY FUNCTIONALITIES OF THE NB DSS:

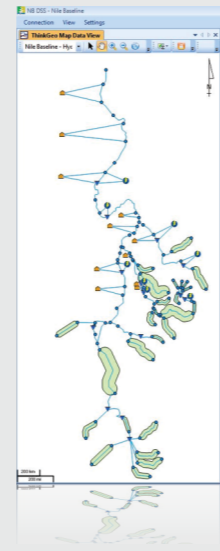
Comprehensive Information Management



The NB DSS has an integrated comprehensive database coupled with a suite of statistical and other data management tools for analysis, visualization and archiving of diverse types of data. With its integrated metadata capability data items can be documented, audited and traced. Its

GIS functionality enables users to analyze and generate spatial and geo-referenced datasets.

Simulation of river basin hydrologic processes



The NB DSS offers integrated modeling tools for simulating water balance, water allocation, river flow, erosion and sedimentation at varying scales. Its modeling environment allows investigation of impacts of existing and anticipated different types and scales of water infrastructure investments and water uses (e.g. hydropower, irrigated agriculture).

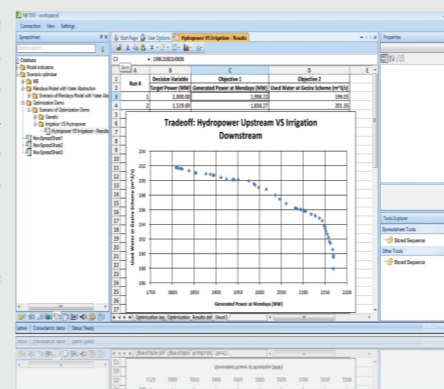
For large river basins, where a range of modeling tools need to be used, NB DSS provides alternative modeling tools with a built-in model linking/nesting facility. This facility allows users to seamlessly integrate various modeling approaches in relevant parts of a basin thereby capturing complexities of catchment processes in a holistic and integrated manner. Users are no more restricted to use only one modeling tool for a basin.

Integration of environmental and socio-economic objectives

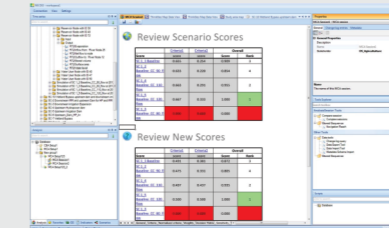
The integration of environmental and socio-economic objectives in water resources plans is a key requirement of integrated water resources management (IWRM). The NB DSS has a built-in flexible indicator tool for evaluation (quantification) of environmental and socio-economic consequences of water resources development and management scenarios. on the other. These quantified indicators, in turn, can be used to rank water resources scenarios using the multi-criteria decision analysis tool.

Multi-objective Optimization

The optimization tool the NB DSS provides is versatile. It generates optimal solutions to a range of water resources planning problems. Users can integrate economic, social and environmental parameters in defining the objective functions.



Multi-criteria Decision Analysis

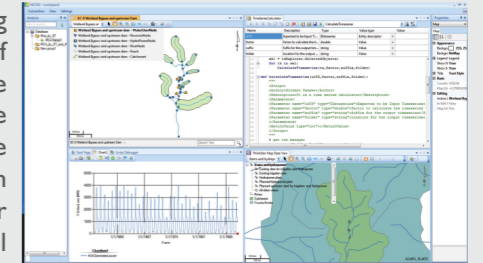


Water resources decision making is increasingly becoming a multi-stakeholder negotiation process. In such a process, the objectives and preferences of range of stakeholders and decision makers (in a multi-jurisdiction context) have to be taken into account. Thus, the decision for selecting among a set of possible development and management options is not straightforward.

The NB DSS offers a built-in multi-criteria analysis tool that supports informed decision making through evaluation of consequences of various decision options in a transparent and objective manner.

Scenario analysis and management

Water resources planning involve evaluation of a set of scenarios that capture possible future states of the basin. Without the capability to work with scenarios, any water resources planning tool cannot be complete.



The NB DSS provides a versatile facility for creating, editing, simulating and analyzing water resources development and management scenarios. The DSS scenario comparison tool helps users compare different scenarios in terms of parameters selected by the user. The built-in cost-benefit-analysis functions allow the quantification of benefits, impacts and tradeoffs of scenarios.

NB DSS is an integrated solution with flexible/scalable architecture

The various components of the NB DSS are interconnected - any component of the NB DSS has access to any data set used or generated by another component. The DSS can be extended with new toolset without the need for a major change to the program code thereby making it easily adaptable to address emerging needs of users.