project description

Strengthening the Planning Sector of the Ministry of Public Works and Water Resources Egypt

assignment

Egypt mainly depends on the river Nile for its water supply. The pressure on the available water resources is severe: the present per capita availability of water is some 1000 m3/year. The rapid increase in population and developments in industry requires a careful management of Egypt's water resources. In the framework of Egypt's environmental action plan, the need was identified to develop a National Water Resources Plan (NWRP). The definition and implementation of such a plan requires a well-developed Planning Sector in the responsible Ministry of Public Works and Water Resources (MPWWR). For this reason the preparation of a NWRP was preceded by a Technical Assiastance (TA) project aimed at strengthening the Water Resources Planning Group of the Ministry.

The project was carried out by WL | DELFT HYDRAULICS in co-operation with the Netherlands Ministry of Transport, Public Works and Water Management, RIZA; the European-American Centre for Policy Analysis/RAND (EAC); and IHE Delft.

client

The Directorate General for International Co-operation (DGIS), Ministry of Foreign Affairs, the Netherlands, financed the TA project. The implementing agency in Egypt was the Ministry of Public Works and Water Resources (MPWWR).

period

June 1994 - October 1998.

Map of Egypt

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T1001-E

project

The threat of Nile water resources being insufficient in quantity and quality in the near future requires immediate, efficient and co-ordinated action. The Planning Sector of MPWWR has to play a central role in the development of strategies for sound and sustainable use and development of the water resources of Egypt. The main objective of the Strengthening the Planning Sector (SPS) project is:

To provide the Planning Sector of MPWWR with the knowledge and tools that will enable the Ministry to develop their policies and long-term strategies in the field of water resources.

Water resources management requires that quantitative and qualitative problems are approached in an integrated way. This integrated approach has been emphasised in the execution of case studies. At the start of the project, a wide range of water supply and distribution models was already available at the Planning Sector. The SPS project supplemented these models with a generally applicable decision support system (DSS) for Water Quality management. The emphasis in the project has been on the integration and application of these instruments. The main themes in the project are:

- *Water resources planning*, introduction of a methodology in which the various aspects of the plan preparation are handled in a logical and integrated way;

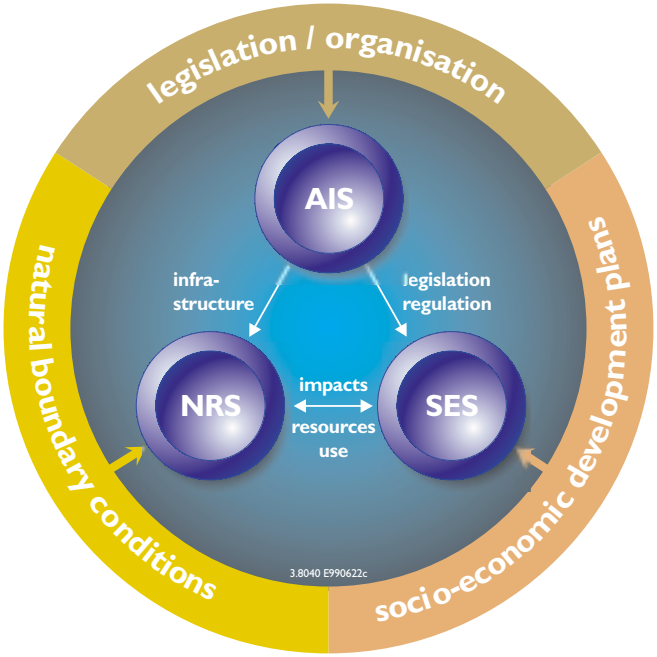
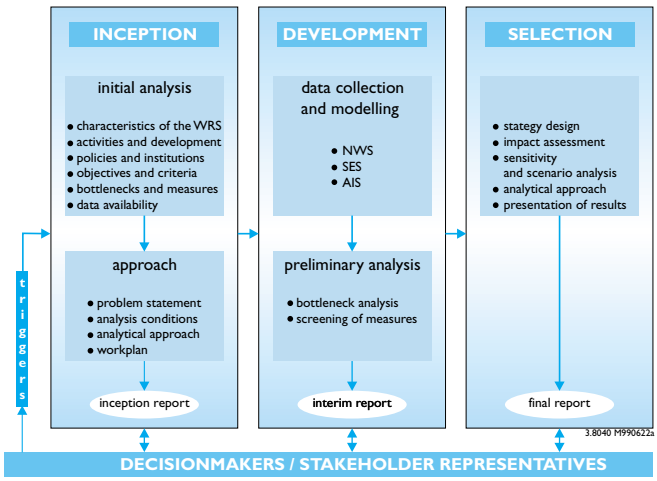


Figure 2: Context of WRP

- *Water quality management*, introduction of a DSS and implementation of the DSS to the Nile river and the Delta;
- *Institutional aspects of water resources planning*, analysis of the role and function of the Water Resources Planning Group (WRPG) and review of existing water policies and legislation;
- *Training* , hands on experience in the execution of case studies, formal training in the Netherlands, short courses, study tours and visits to conferences.

Figure 1:
Conceptual Frame Work



water resources planning

The process of the preparation of a water resources plan can be structured as a logical sequence of well defined activities. WL | DELFT HYDRAULICS developed a so-called conceptual framework (Figure 1) for water resources and water quality management studies that has been applied in a large number of national and regional studies. In the SPS project, the conceptual framework has been introduced in the Planning Sector through training courses and application in case studies.

For the analysis of a Water Resources System it is useful to subdivide the system into three subsystems:

- the *Natural Resources System* (NRS) being the system of rivers, lakes, groundwater aquifers -including the related ecosystems- and the infrastructure required to manage and use the water resources;
- the *Socio-Economic System* (SES), the water using and water related human activities;
- the *Administrative and Institutional System* (AIS), the administration, legislation and regulation of the WRS. The AIS includes the authorities responsible for the management of the WRS and related laws and regulations.

The NRS refers to the supply side of the system and the SES to the demand side. The control of both the supply and the demand side of the resources is provided by the AIS. The three subsystems and their interaction are shown in Figure 2.

water quality management

Water quality management is a complex task as it includes many aspects. Management includes both policy development and the design of strategies to reach these policy objectives. The combination of models, data bases, presentation and analysis software is indicated as a Decision Support System (DSS). WL | DELFT HYDRAULICS has developed a DSS for water quality management, tuned to the conceptual framework described above. The DSS allows the definition of strategies and scenarios in general terms, familiar to planners or decision makers and the evaluation or analysis of results using graphical presentations. Figure 3 depicts the structure of the DSS. The DSS comprises among others a complete water quality model (DELWAQ) and a model that quantifies the waste loads from human activities in an area (Waste Load Model, WLM).

The DSS for water quality management has been implemented for two applications: the river Nile from the High Aswan Dam to the Mediterranean Sea and the Eastern Nile Delta. These applications can be used to assess the effects of pollution control strategies on the water quality in the Nile and the Delta. The DSS has been used for the

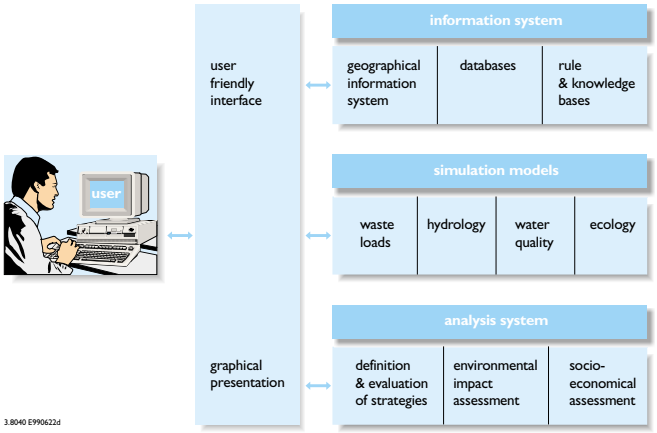


Figure 3:
Outline of the Decision Support System

analysis of combinations of development scenarios and municipal pollution control strategies for the Nile river. The staff of the WRPG has fully participated in the development of the applications and is now capable of using and modifying the applications.

institutional aspects of water resources planning

The role and function of the WRPG, its co-ordination within MPWWR and with other stakeholders in water resources planning has been reviewed, and an action plan has been prepared. The project developed a network of contacts essential for the future plan preparation within the MPWWR, with other agencies involved in water resources management and with related projects. Various workshops and round table meetings were organised to facilitate the exchange of professional experience. Examples of subjects are:

- Management strategies for coping with water scarcity;
- The process of water resources planning in Egypt and the Netherlands;
- Water quality management in Egypt and the Netherlands; and
- Social, economic and institutional aspects of water resources planning.

Laws and regulations related to water resources management, including water quality management have been reviewed with respect to their suitability for the present and future management of Egypt's water resources. Possible improvements were suggested and recommendations were made to modify existing laws in a way that they will provide a better basis for the planning process. On the basis of an evaluation of the MPWWR policies in view of present and expected problems related to water scarcity and water quality some recommendations were given for the development of a Water Policy.

training

In the course of the project, three staff members have completed a one year post graduate training course in hydraulic and environmental engineering (at IHE Delft); two of them also completed their Msc study. One staff member is completing his PhD at Delft University of Technology. Through workshops and tailor made courses, the staff of the WRPG has been trained in many aspects of water resources planning, e.g. water requirements, demand management, groundwater resources, water quality management, socio-economy, cost/ benefit analysis, ecology, environmental impact assessment and project management.

Hands-on experience was gained in the following case studies:

- Reduction of Nile water losses;
- Optimum water supply to the Eastern Nile Delta;
- Cropping patterns;
- Water conservation; and
- Pollution control strategies.

National Water Resources Plan

In the summer of 1998 WL | DELFT HYDRAULICS obtained a contract for the preparation of a National Water Resources Plan for Egypt. The project, which has a duration of four years, started October 1, 1998. The project is a logical follow up of the SPS project and as such, it will be implemented in the WRPG of the Planning Sector of MPWWR.

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Decisive advice: from multidisciplinary policy studies to design and technical assistance on all water-related issues.

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