



MIKE CUSTOMISED CASE STORY

MANAGING THE INCREASING WATER DEMANDS OF A GROWING POPULATION

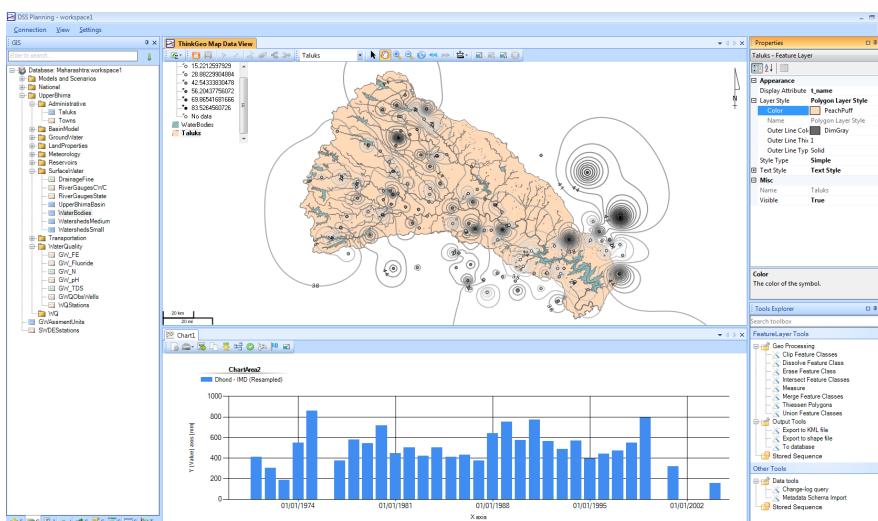
Using DSS to improve water resource planning in India

Like many developing countries, India's water resources are under increasing strain. The country is subject to floods, droughts and overuse of water resources. Not having a clear overview of its water conditions, made it difficult for local authorities to manage this precious resource. Using our local knowledge of India, we developed a Decision Support System (DSS) to help them improve their short- and long-term water resource planning.

INCREASING PRESSURE ON RESOURCES

India has a population of over one billion people, making it the second most populous nation on earth. The country's growing population is putting increasing pressure on its natural resources. In some areas, water is overexploited and polluted, negatively impacting both its quantity and quality. In addition, many areas of the country experience flooding during the monsoon season. This makes efficient resource development and management incredibly difficult.

In recent decades, India has taken several measures to improve the management of its water resources. Implemented under the Hydrology Project and financed by the World Bank, the initiatives initially focused on improving data collection and management. The second phase of the project focused on strengthening decision support tools in order to address five key water resources issues including:



Screenshot of DSS Planning showing combined GIS and time series information.

SUMMARY

CLIENT

National Institute of Hydrology

CHALLENGE

- Inadequate knowledge of the complex water situation in the country
- Difficulty ensuring sufficient water quantity and quality for all users
- Overexploitation of water resources due to increasing demands
- Increased flood damage in many areas during the monsoon season

SOLUTION

Decision Support System (DSS) built on our MIKE CUSTOMISED by DHI platform

VALUE

- Increased knowledge of the state of water resources and the complex water situation
- Improved ability to plan and manage water resources

LOCATION / COUNTRY

India

- surface water planning
- integrated operation of reservoirs
- surface water and groundwater planning
- drought monitoring, assessment and management
- management of the quality of surface and groundwater

IMPROVING WATER MANAGEMENT

Since the 1980s, we have helped India's water authorities meet the challenges posed by floods and droughts. We used our local knowledge of the country to develop a Decision Support System (DSS) software package for nine states and six central agencies in India. Driven by our MIKE CUSTOMISED by DHI platform, the DSS allows water authorities to:

- predict the impact of proposed changes to water management infrastructure on water resources
- improve their water resource planning
- create awareness among stakeholders and the general public

The DSS allows users to import and apply models that simulate the impact of changes on water management and demands, such as:

- construction of a new dam
- conjunctive use of surface and groundwater
- transferring water to a neighbouring basin
- artificial recharge to groundwater during the wet season



The nine Indian states where the project was implemented.

The models determine the consequences of these changes for water users and the environment (locally and downstream). Local water authorities can then utilise the results for short- and long-term planning.

The DSS also includes several elements that support water management activities. For example, users can easily import Geographical Information System (GIS) and time series data into the DSS. All relevant personnel can be given access to this data. A wide range of tools allows users to:

- import, analyse, display, and quality assure the data
- export data for external use
- inform the public about the state of key water resources (for example, reservoir or groundwater levels)

Once the model analyses are completed, the key results can be used to negotiate the distribution of limited water resources. In dialogue with the water users, authorities can thereby identify balanced solutions to conflicts and highlight critical issues.

PROVIDING CONTINUED SUPPORT

In addition, the DSS can serve as a central hub for data, maps, models, and other information. The tools and components of the system are all inter-linked and connected to the central database. This gives users a wide degree of flexibility in terms of where the system is installed. As long as there is intranet access to the DSS server, the system can be installed in any office.

The use of advanced technology in water management is still new to state authorities in India. Many staff members have difficulties understanding the tools and fully benefiting from their potential. As such, we will continue to support the users of our DSS over the coming years.

A COLLABORATIVE EFFORT

We implemented this project in parallel with a similar project in Africa (developing a DSS for the Nile Basin Initiative) and two other real-time water management projects in India. Each project contributed resources to the joint development of a comprehensive software package. This software package eventually became MIKE CUSTOMISED by DHI. Managed by experienced software engineers from DHI Denmark, DHI India, and DHI China, we implemented the software package in cooperation with the Indian software company TCS.

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