



Historical Development of Hydroinformatics Tools in Bangladesh and Challenges and state-of-the-art in Urban Drainage Modelling

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EXTENDED ABSTRACT

Hydroinformatics has become a major discipline for water resources professionals worldwide as well as in Bangladesh. In the last few decades it has developed immensely and had profound influence on how these professionals practice engineering. It helped building the bridge between engineers and non-engineering experts. Development activities are not only considered for economic viability, but now it is also possible to take into account multi-sectoral considerations to make projects sustainable.

In a country like Bangladesh where severe imbalances of water availability exist during different period of the year, it is inevitable that any solution for a problem of one water user will have an adverse impact on another. The issue then becomes one of minimizing the impacts. The need for an integrated approach to water resources management where cross sectoral integration can be evaluated becomes pre-requisite.

Integrated planning and management requires understanding of the natural and physical processes of the water resources system as well as to analyze, evaluate and compare transient water resources systems under changing environmental, socio-technical and socio-economic conditions. This call for appropriate tools and technologies to support decision making that would help in evaluating different strategies or options for water resources management.

The need for such analytical tools was first recognised in early eighties during the preparation of the Bangladesh National Water Plan (NWP). Mathematical modelling technology was introduced at that time for generating data, simulating planning scenarios and supporting decisions. Over the next three decades, mathematical models of entire surface water system including the Bay of Bengal were developed. Surface water and groundwater interaction model for the entire Bangladesh is now in the final stage of development. These models are being used extensively in Bangladesh to solve different water related issues like floods, low flow, salinity, water quality, surface water and ground water assessment, river bank erosion, storm surge, sedimentation, urban flooding, climate change impacts etc.

In the early nineties in Bangladesh, mathematical models were producing outputs in formats which were convenient for the engineers or modellers to comprehend but inconvenient for other users like sociologists, economists, policy makers and other

stakeholders. By the middle of nineties, major efforts were invested to interface mathematical models with Geographic Information Systems (GIS). At around the same time, various commercial software as well as newly developed animation technologies were used to create animation of model generated time series data. The interfaced system of mathematical models and GIS and model data animation systems opened a new arena which was capable of producing and representing model outputs in formats more easy for other users to understand and participate in necessary discourse on the issue at hand readily. However, modellers in Bangladesh were receiving a growing demand for dissemination of model outputs, particularly flood forecasting outputs, to the wider community. Successful experiments with web and WAP technologies allowed for dissemination of such outputs to large number of people in Bangladesh. Therefore, the middle nineties was time when, in real sense, Bangladesh started embracing the hydroinformatics technologies for data acquisition, analysis and modelling and dissemination.

This presentation will briefly describe the progress made in the application of hydroinformatics tools in various sectors in Bangladesh like water resources, water supply and sanitation, communication, agriculture, disaster management etc. The presentation will discuss the likely new development and applications of hydroinformatics tools in the future and its implication on the overall engineering practices in Bangladesh. A case study on the application of hydroinformatics tools for urban drainage management for Dhaka city will be also presented.

References

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