INTEGRATED BASIN WATER RESOURCES MANAGEMENT SYSTEM IN KOREA

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The technical framework of the IRWMS (Integrated Real-time Water Management System) was developed by support of the long-term New Frontier Research Program (2001 – 2010) of Korean Government securing additional water resources in a sustainable, non-structural manner by developing and implementing advanced water management technology. This paper pertains to the needs, objectives, and the formulated framework of the developing decision support tools used in the future implementation plan. The basin water management toolkit, IRWMS, supports a coordinated multiple reservoir system operation considering not only water quantity and water quality simultaneously, but also water use priority, and maximization of water benefit. The optimal behavior of the systems under uncertainty is determined based on the physically based long-term meteorologic forecast. The IRWMS developed for the Geum river basin consists of a variety of coordinated sub-models; hydrometeorological forecast model, basin-wide continuous rainfall-runoff analysis model, reservoirs system simulation and optimization models, river and reservoir water quality simulation models and real time water information system (Fig. 1).

In contrast to traditional water management practices, the IRWMS approach seeks sustainable, equitable and efficient water management. In order to meet the changing needs of a complex river basin water management environment, the advanced technology for basin-wide integrated river and reservoir systems management should be urgently developed and implemented. The system will serve as the decision support tool for integrated river and reservoir systems operation throughout extensive calibration and validation conducted during the 2nd and the 3rd stages of the project (2004～2010). It will

support both long-term and short-term reservoirs system operations based on multiple objective analysis and deficit supply methods. The IRWMS will provide predictable water resources management on river water quantity and quality, and short-term and long-term water balances for river basin water managers, municipal governments, stakeholders, and the local residents in the basin through a web-based network system.
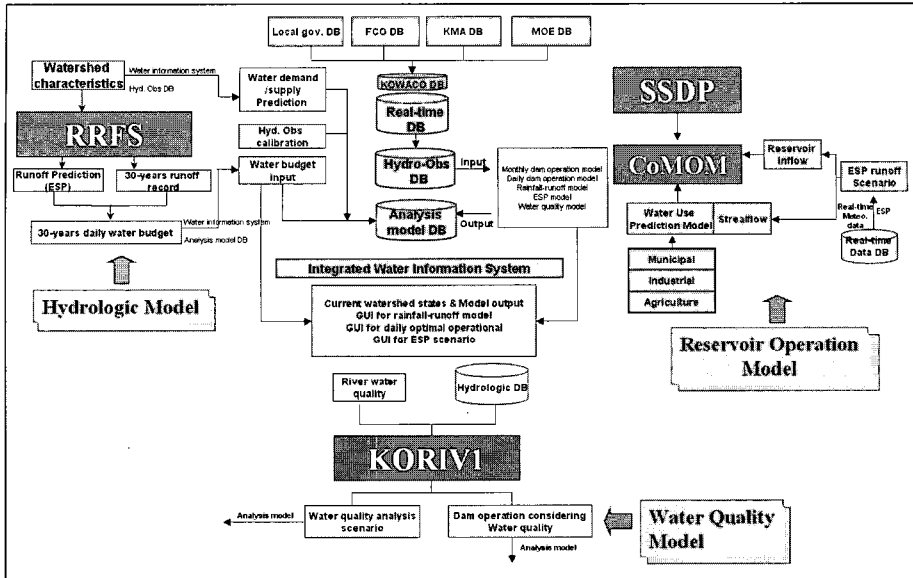

Fig. 1 Schematic diagram of the IRWMS structure