



Anticipatory Water Management; cost-benefit analysis

S. J. van Andel (1), A. H. Lobbrecht (1,2), R. K. Price (1)

(1) UNESCO-IHE, Delft, the Netherlands, (2) HydroLogic BV, Amersfoort, the Netherlands
(s.vanandel@unesco-ihe.org / Fax: +31 (0)15 212 2921) / Phone: +31 (0)15 215 1715)

Anticipatory Water Management is the operational management of water systems on the basis of forecasts of extreme events. While in real-time control measurements of water levels and precipitation play an important role, in anticipatory water management and early warning decisions have to be made before an event occurs. Therefore, the use of medium range meteorological forecasts is at the core of this research. The concerned application is flood control; hence the focus is on rainfall forecasts.

Ensemble rainfall forecasts provide forecasts of forecast uncertainty. This information allows for a wide range of risk based decision methods to decide on whether to apply anticipatory control actions and how. Selection of decision rules and control strategies depends on cost-benefit analysis of the alternatives. Archives of measurements and forecasts together with water-system control models allow for simulation of operational water management strategies. Multi-year hindcast analysis allows for searching for least cost alternatives.

Still, challenges remain in defining which sources of costs and benefits should be included and how they should be assessed. While direct cost functions of flood damage have a high degree of uncertainty, cost functions variability of intangible costs, such as loss of confidence in flood alerts, is even bigger. Secondly, the range of options in dealing with ensemble forecasts and anticipatory control strategies is such, that straightforward optimisation (minimisation of costs) is not feasible.

These issues in cost-benefit analysis and proposed solutions are discussed. Results for a flood control case-study in the Netherlands are presented.