

Shortage and surplus of water in the socio-hydrological context

A. SCHUMANN & D. NIJSSEN

*Institute of Hydrology, Water Resources Management and Environmental Engineering, Ruhr University Bochum,
D-44780 Bochum, Germany*

andreas.schumann@rub.de

Abstract Balancing the temporal variability of hydrological conditions in the long- and short-term is often essential for steady socio-economic conditions. However, this equilibrium is very fragile in many cases. Hydrological changes or socio-economic changes may destroy it in a short time. If we extend the bearing capacity of socio-hydrological systems we increase, in many cases, the harmful consequences of failures. Here, two case studies are discussed to illustrate these problems. The limited success at adapting water resources to increasing human requirements without consideration of the natural capacities will be discussed with the example of water use for irrigation in northeastern China. The demand for a new planning approach, which is based on a combination of monitoring, model-based impact assessments and spatial distributed planning, is demonstrated. The problems of water surplus, which becomes evident during floods, are discussed in a second case study. It is shown that flood protection depends strongly on expectations of flood characteristics. The gap between the social requirement for complete flood prevention and the remaining risk of flood damage becomes obvious. An increase of risk-awareness would be more sustainable than promises of flood protection, which are the basis for technical measures to affect floods and (or) to prevent flood damages.

Key words droughts; irrigation; economy; floods; flood protection; risk