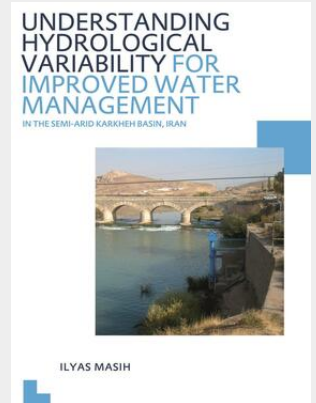


Masih

Understanding Hydrological Variability for Improved Water Management in the Semi-Arid Karkheh Basin, Iran

UNESCO-IHE PhD Thesis

This study provides a hydrology based assessment of (surface) water resources and its continuum of variability and change at different spatio-temporal scales in the semi-arid Karkheh Basin, Iran, where water is scarce, competition among users is high and massive water resources development is under way. The study reveals that the ongoing allocation planning is not sustainable and essentially requires reformulation, with consideration of spatio-temporal variability and observed trends in the streamflows regarding flood intensification and decline in low flows. The development of innovative methods for quantification of the hydrological fluxes (i.e., regionalization of model parameters based on similarity of the flow duration curve and the use of areal precipitation input in the hydrological modeling) helped better understanding and modeling the basin hydrology. The investigation of scenarios for upgrading rain-fed areas to irrigated agriculture, using SWAT, recommends the promotion of in-situ soil and water conservation techniques. Conversion of rain-fed areas to irrigation causes significant reduction in the downstream flows, and requires additional considerations such as less development in the upper catchments, practicing supplementary irrigation and developing water storage. The knowledge generated is instructive for hydrological assessment and its use in water resources planning and management in the river basin context.



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