

Assessing the Impact of Human Behaviour on Water Resource Systems Performance: A Conceptual Framework

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Abstract : The poor performance of water resource systems (WRS) has been reportedly linked to not only climate variability and the water demand dynamics but also human behaviour-driven unlawful activities. Some of these unlawful activities that have been adversely affecting water sector include unauthorized water abstractions, water wastage behaviour, refusal of water re-use measures, excessive operational losses, discharging untreated or improperly treated wastewater, over-application of chemicals by agricultural users and fraudulent WRS operation. Despite advances in WRS planning, operation, and analysis incorporating such undesirable human activities to quantitatively assess their impact on WRS performance remain elusive. This study was then inspired by the need to develop a methodological framework for WRS performance assessment that integrates the impact of human behaviour with WRS performance assessment analysis. We, therefore, proposed a conceptual framework for assessing the impact of human behaviour on WRS performance using the concept of socio-hydrology. The framework identifies and couples four major sources of WRS-related values (water values, water systems, water managers, and water users) using three missing links between human and water in the management of WRS (interactions, outcomes, and feedbacks). The framework is to serve as a database for choosing relevant social and hydrological variables and to understand the intrinsic relations between the selected variables to study a specific human-water problem in the context of WRS management.

Keywords : conceptual framework, human behaviour; socio-hydrology; water resource systems

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