

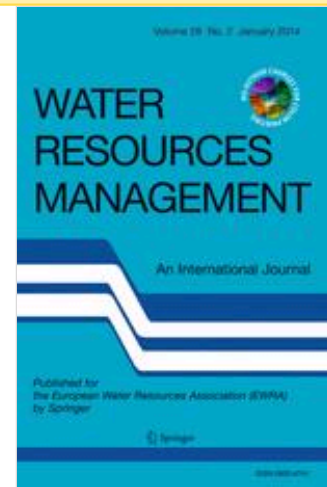
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Water Resources Management

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Description

Water Resources Management is an international, multidisciplinary forum for the publication of original contributions and the exchange of knowledge and experience on the management of water resources. In particular, the journal publishes contributions on water resources assessment, development, conservation and control, emphasizing policies and strategies. Contributions examine planning and design of water resource systems, and operation, maintenance and administration of water resource systems. Coverage extends to these closely related topics: water demand and consumption; applied surface and groundwater hydrology; water management techniques; simulation and modelling of water resource systems; forecasting and control of quantity and quality of water; economic and social aspects of water use; legislation and water resources protection. Water Resources Management is supported scientifically by the European Water Resources Association, a scientific and technical nonprofit-making European association.



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Abstract The problem of allocation of limited water resources for multiple and diverse activities with growing demand calls for the need to develop appropriate tools for water allocation. This work develops a methodology to estimate the economic value of water in a basin with large hydropower production and a growing demand for rice irrigation, based on a coupled hydrological and electric system modelling approach. Inflow deficits to the hydroelectric system induced by the irrigation reservoirs within the basin are simulated under different irrigation scenarios. The simulated inflow deficits are integrated to an existing model of the interconnected electric system to evaluate the associated increase in generation cost under different energy scenarios. The impact of inflow deficits is enhanced and spilled flow and generation cost are also evaluated. The results show that the interannual variability of reservoir inflow is normalized by yearly varying rice planting area, which leads to a significant change substantially. Moreover, irrigation area is also sensitive to energy decrease as the proportion of hydropower.

Keywords Water management · Irrigation · Hydropower · Energy · Reservoir

Notation
 DC = Direct cost of the electric system
 DCI = Direct cost increase of the electric system
 Q = Inflow to Gabriel Terra reservoir
 Q_s = Spilled flow from Gabriel Terra reservoir
 Q_r = Irrigation flow from Gabriel Terra reservoir

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