

[Keynote Talk]: Water Resources Vulnerability Assessment to Climate Change in a Semi-Arid Basin of South India

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Abstract : This paper examines vulnerability assessment of water resources in a semi-arid basin using the 4-step approach. The vulnerability assessment framework is developed to study the water resources vulnerability which includes the creation of GIS-based vulnerability maps. These maps represent the spatial variability of the vulnerability index. This paper introduces the 4-step approach to assess vulnerability that incorporates a new set of indicators. The approach is demonstrated using a framework composed of a precipitation data for (1975–2010) period, temperature data for (1965–2010) period, hydrological model outputs and the water resources GIS data base. The vulnerability assessment is a function of three components such as exposure, sensitivity and adaptive capacity. The current water resources vulnerability is assessed using GIS based spatio-temporal information. Rainfall Coefficient of Variation, monsoon onset and end date, rainy days, seasonality indices, temperature are selected for the criterion 'exposure'. Water yield, ground water recharge, evapotranspiration (ET) are selected for the criterion 'sensitivity'. Type of irrigation and storage structures are selected for the criterion 'Adaptive capacity'. These indicators were mapped and integrated in GIS environment using overlay analysis. The five sub-basins, namely Arjunanadhi, Kousiganadhi, Sindapalli-Uppodai and Vallampatti Odai, fall under medium vulnerability profile, which indicates that the basin is under moderate stress of water resources. The paper also explores prioritization of sub-basinwise adaptation strategies to climate change based on the vulnerability indices.

Keywords : adaptive capacity, exposure, overlay analysis, sensitivity, vulnerability

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