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Stiffness and sensitivity criteria and their application to water resources assessment

Babak Zolghadr-Asli¹; Omid Bozorg-Haddad²; and Hugo A. Loáiciga³

Abstract

The performance assessment of water resources systems is a vital step in achieving sustainable development. A complicating factor in performance assessment is the randomness of inputs to water resources systems, such as that present in reservoir inflows. This study proposes weighted vulnerability for performance assessment of water resources systems. Weighted vulnerability is coupled with the application of stiffness and sensitivity criteria to quantify the plausible impacts of variable inputs (either controllable or uncontrollable) on water resources systems. These criteria identify the controllable and uncontrollable inputs with the largest effect on the performance of water resources systems. The application of weighted vulnerability, stiffness, and sensitivity criteria is herein applied to analyze the performance of the Aigoghmoush dam (East Azerbaijan, Iran).

Keywords: Performance Criteria, Weighted Vulnerability, Water Resource planning and Management, Sustainable Development.

1. Introduction

Water is a valuable economic, ecologic, and social asset (Fernández-Pacheco et al., 2015; Zolghadr-Asli et al., 2017). Overexploitation and careless use of water, however, has compromised the reliability of its supply and degraded its quality in many instances, leading

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