Abstract

Long term and mid-term reservoir operation involves derivation of rule curves for optimal management of the available resource. The present work deals with reservoir operation in the Aurès arid region. As an example, Babar reservoir is selected to apply the proposed approach which estimates all the water balance terms, especially those which are random as water inflows. For each demand scenario a reservoir operation optimization model using Explicit Stochastic Dynamic Programming (ESDP) is performed, to derive optimal rule curves based on historical operating records (Jan 2002–Dec 2013) and using “Reservoir” R package®. Subsequently, risk analysis is conducted for these different demand scenarios rules by the RRV (reliability, resilience, vulnerability) metrics. Results show the advantage of using the “Reservoir” R package for a rapid and an easy analysis of the performance criteria jointly with the optimization algorithm to Re-operate Reservoir operation.

Key words: arid region, Babar reservoir, Explicit Stochastic Dynamic Programming (ESDP), optimization, performance, reservoir, risk, RRV (reliability, resilience, vulnerability)