Determining optimal scale of water infrastructure considering economical aspects with stochastic evaluation – Case study at the Municipality of Western Mani

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Infrastructures for the supply of water are one of the most necessary facilities in modern life. The optimal design of such infrastructures (for example, dams or even small-size tanks) is often a great challenge in civil engineering, given the large number of factors required for their design (e.g., feasibility, reliability, cost effectiveness, resilience). One of the most critical decisions that may have a great impact on the optimization procedure is the determination of the scale of the proposed system.

During a study of such a design of a water supply infrastructure in the Municipality of Western Mani, it became clear that several solutions of different scales coexisted. Ultimately, the cost-benefit factors were the most heavily considered ones, provided that the required reliability was met. Stochastic methods have been proven to be appropriate tools for studying such highly complex and uncertain puzzles. The current study intends to approach this problem by considering solutions of different scales, and to establish the long-term cost effectiveness as the main criterion to evaluate the different solutions.