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Optimizing water infrastructure solutions for small-scale distributed settlements – Case study at the Municipality of Western Mani.

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Water infrastructure is an indicator of human civilization and its evolution. The sustainable water management and distribution to local communities remains a critical engineering priority so that the most efficient usage is achieved. In this analysis the design of water-infrastructure establishments is studied for the community of the Municipality of Western Mani (western Peloponnese, Greece).

One of the main issues that arise is the presence of karstic-limestone geological structure at the study area with no permanent watercourses. Furthermore, the lack of data about the current quantity of surface water makes it difficult to formulate trustworthy conclusions on the availability of water resources. Additionally, the notable growth of the tourist sector during the summer months in the past few years exacerbates this issue. Due to the above reasons, the available water is not enough to cover the needs of the Municipality, especially during the summer.

After examining all the possible options that have been proposed to increase the water availability (e.g., through dams, wells, desalination, water ponds etc.), we investigate an optimal solution that aims to achieve a more efficient water management and distribution to the communities of Western Mani. To this aim, we apply a multi-criteria decision-making approach by also considering local traditional water harvesting systems to increase water resilience.