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The importance of digital irrigation advisory system: evidence from Zarafshan River Basin, Uzbekistan

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The importance of digitalization in agriculture has been steadily growing worldwide, particularly under the conditions of climate change and resource scarcity. Despite the widespread adoption of digital technologies and digital services in agricultural production, there is still limited real-time data-based evidence on the effectiveness of digital irrigation system in the global literature. To address this gap, this study aims to provide comprehensive insights into technical background, experimental methodology, and the key findings of a case study implemented in the Zarafshan River Basin, Uzbekistan. The study systematically assesses the performance of climate-responsive irrigation scheduling by examining multiple dimensions of agricultural productivity and resource-use efficiency under field conditions. More specifically, water savings, total crop productivity and crop water productivity indicators are evaluated across the four distinct treatments. The findings of the study highlight not only the efficiency gains achieved through digital irrigation advisory systems, but also the practical trade-offs between maximizing yield and minimizing water consumption under conditions of increasing water scarcity and climate change in the country.