

Are Irrigation Activities Sustainable? A Preliminary Data-driven Perspective

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In semi-arid regions, agricultural productivity highly relies on aquifers for irrigation. To ensure sustainable groundwater use, it is critical to understand if irrigation activities aligns with sustainable agricultural practices. Such information is important to water managers for developing planning and management strategies for groundwater sustainability. This study aims to estimate the behavioral patterns of irrigation activities in a semi-arid agricultural landscape using autonomous sensor measurements and satellite remote sensing datasets. We characterize the patterns based on the irrigation frequency and the timing relative to soil and weather conditions using statistical analyses and existing knowledge. Our preliminary results indicate such a data-driven approach may inform the development and calibration of more sophisticated irrigation decision-making models. The research is expected to benefit the estimation of irrigation using social-hydrological modeling approaches.