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ASSESSING CLIMATE CHANGE EFFECTS ON AGRICULTURAL WATER DEMAND
IN ABADAN USING LARS WG 8
(CMIP6 SSP SCENARIOS)

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Climate change in hot and arid regions like Abadan poses a serious threat to food security and water resources. Accurate projections of future conditions are essential for developing effective adaptation strategies. In this study, the LARS-WG 8 model was applied using meteorological data from Abadan station (Iran) under three climate scenarios, SSP1-2.6, SSP2-4.5, and SSP5-8.5, for the year 2040. Interpretation of the climate data for 2023 and 2024 compared to future scenarios for 2040 (SSP1-2.6, SSP2-4.5, SSP5-8.5) at Abadan station reveals a clear trend of warming and seasonal shifts in precipitation. In July, maximum temperature rises from 47.2°C (2024) to 48.7°C (SSP5-8.5), while evapotranspiration drops from 393.5 mm to around 291–294 mm, a 25% reduction. December precipitation increases dramatically from 0.8 mm to 25.7 mm in SSP5-8.5, over 30 times higher. In contrast, rainfall in June remains zero across all scenarios. March precipitation declines from 45.0 mm to 19.1 mm in SSP2-4.5 (a 58% drop), while minimum temperature rises from 13.9°C to 16.0–16.5°C (about 15% increase). These shifts indicate higher temperatures, reduced summer evapotranspiration, and a concentration of rainfall in cooler months, directly affecting crop water needs and irrigation scheduling. Based on the results obtained, it is recommended that agricultural planning in Abadan move towards climate change-resistant cropping patterns, improve irrigation efficiency, and revise water allocation plans to take into account the increasing temperature and increasing concentration of precipitation in the cold months of the year.

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Keywords: CMIP6, crop water demand, evapotranspiration (ET₀), rainfall redistribution.

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