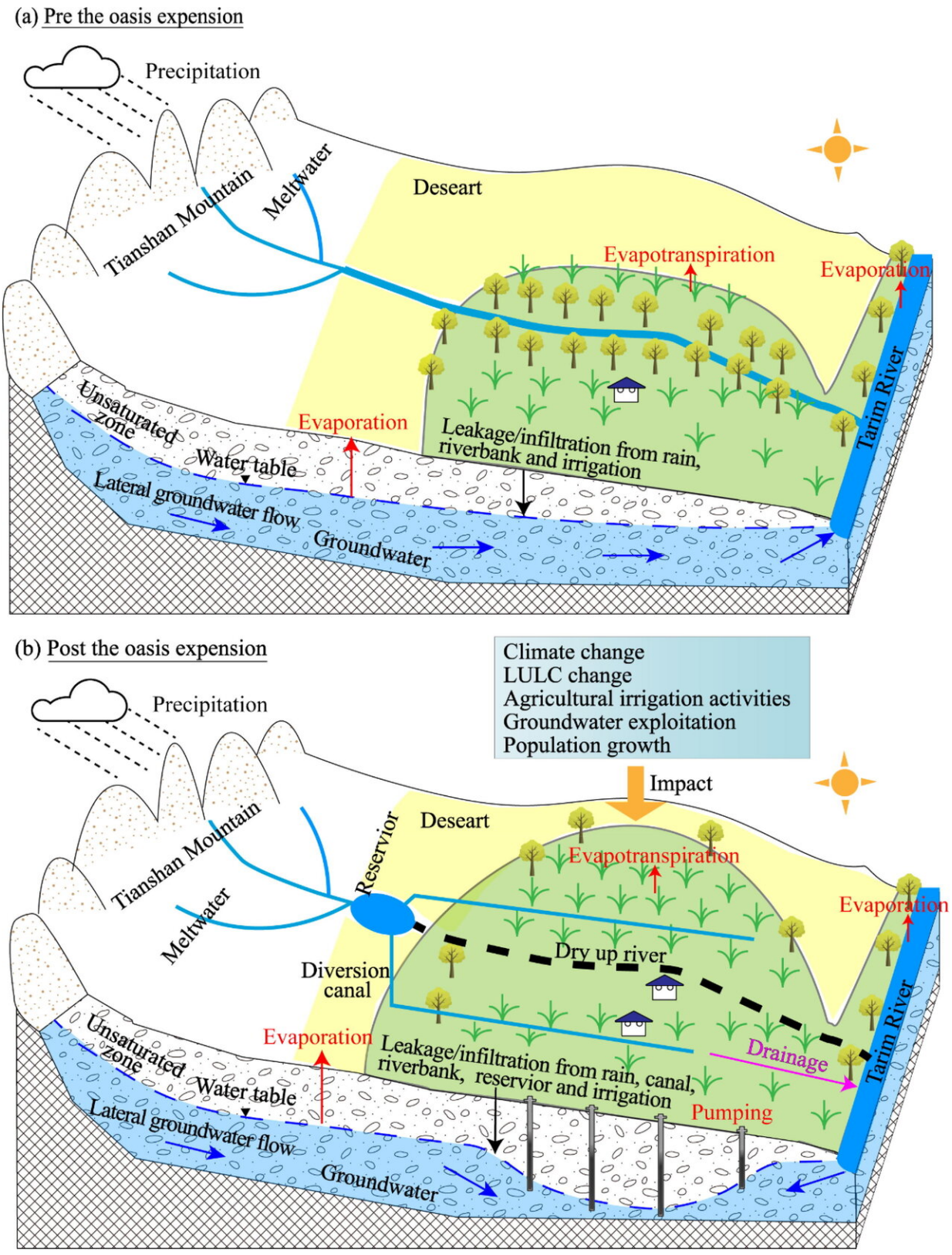
# Scientists verify evolution features and drivers of groundwater in oasis of dried-up river in Tarim Basin

October 23 2020, by Li Yuan




Conceptual diagram depicting groundwater variation due to climate change and

anthropogenic activities in the typical oasis of Tarim Basin. Credit: XIEG

Groundwater is crucial for agricultural, ecological and domestic water use, and its depletion under climatic and anthropogenic impacts can impose challenges on regional water resources and ecological security, particularly in arid regions.

Spatiotemporal variation and drivers of groundwater are critical to understand groundwater cycling and restore groundwater, while they are poorly understood in arid oasis region due to sparse field monitoring.

Researchers from the Xinjiang Institute of Ecology and Geography (XIEG) of the Chinese Academy of Sciences elaborated the spatiotemporal variations and controlling factors of groundwater level and mineralization degree using data collected at 22 wells in the Wei-Ku Oasis of Tarim Basin during 2000-2018.

They used standardized partial regression coefficient and spatial multiple linear regression analysis to evaluate the response of groundwater to human activities and climate variability.

Results showed that obviously large spatial and temporal variations existed in both groundwater level and mineralization degree, and its response to environmental factors varied in space and season.

Groundwater level was the shallowest in spring and deepest in autumn, and exhibited a markedly decreasing trend, mainly due to human activities. While groundwater mineralization degree marginally decreased, mainly due to climate change.

Larger variation of groundwater level depth/ mineralization degree

generally occurred at the areas with greater groundwater level depth/ mineralization degree. Decreasing riverbank leakage and increasing volume of evapotranspiration, groundwater pumping and water drainage led to decreasing groundwater level.

The research results were published in *Journal of Hydrology*, titled "Evolution characteristics of groundwater and its response to climate and land-cover changes in the oasis of dried-up river in Tarim Basin."

**More information:** Wanrui Wang et al. Evolution characteristics of groundwater and its response to climate and land-cover changes in the oasis of dried-up river in Tarim Basin, *Journal of Hydrology* (2020). DOI: 10.1016/j.jhydrol.2020.125644

Provided by Chinese Academy of Sciences