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The impacts of global water stress and the costs of mitigation in the future

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Water stress has increased in many regions of the world during the past decades. It would be likely to continue in the near future due to intensified human activities and changing climate. Better projection of future water stress will facilitate water resources management and planning. Based on the improved water stress index (), we assess the future changes in water stress at the country level under climatic change and socioeconomic dynamics (e.g., population growth, economic development, land-use change) across scenarios. The water deficit, the unmet water demands against local water resources, is estimated for each country. The spatiotemporal characteristics of the global water stress are demonstrated and the main driving force is identified for the exacerbated stress on humans. The monetary value of the water deficit is estimated based on the water price valued for different sources of water withdrawal (e.g., surface water, groundwater, desalination, etc.). The total costs to mitigate or eliminate future water stress are estimated for each country. Finally, the risks and vulnerability due to global change in the future are assessed for each country. This study could be a reference for adaptation to climate change and the potential costs to achieve the SDGs in 2030.