

India's Groundwater and Energy Nexus: It's Worse than we Thought

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A proposed remedy to the Indian groundwater crisis is the Jyotigram Yojana (JGY) scheme, first applied in the state of Gujarat, which provides a separate and rationed electricity supply to farmers and an unrationed power supply to non-agricultural users. The JGY scheme is now employed in 7 Indian states that affects tens of millions of farmers. Using district-level data in Gujarat from 1996 to 2011, we employed a difference-in-differences treatment and regressed average depth from soil surface to groundwater of all observation wells over all seasons for each year.

The treatment variable was whether districts have had JGY fully implemented along with control variables, such as rainfall and cultivated area. Based on this causal model, exhaustively tested for robustness of the key findings, the results show that JGY is associated with an increase in the depth to reach groundwater, on average, by approximately 3 meters across all districts, and by more than 9 meters in overexploited groundwater districts. Our results contradict the commonly accepted view, using non-causal methods, that claim JGY mitigates groundwater extractions.