

Daily Mains Practice Answer 25-08-2026

Q. “Solar irrigation can become a solution to India’s energy crisis while simultaneously becoming a threat to groundwater sustainability.” Discuss. (150 words, 10 marks)

Directions: Intro---- How does it become a solution? + Threat to groundwater sustainability-----Conclusion.

Introduction:

Describe solar irrigation in India - mention some schemes - PM-KUSUM.

Main Body

How does it address India’s energy crisis?

- Reduces dependence on fossil fuels.
- Reduces pressure on DISCOMs - Solarisation can reduce the subsidy burden.
- Decarbonises groundwater irrigation - Groundwater irrigation is estimated to generate 45-62 million tonnes of CO₂ annually.
- Improves energy access and farm resilience, especially in regions with unreliable electricity and high diesel costs.
- Converts farmers into energy producers

Why is it a threat to groundwater sustainability?

Fundamental paradox - Free sunlight → near-zero pumping cost → incentive for excessive pumping → groundwater depletion.

- No marginal cost for extraction, encouraging farmers to pump more water.
- Expansion of irrigated area
- May shift towards water-intensive crops
- Individual farmers benefit from pumping more water, while the cost of aquifer depletion is collectively borne.
- Existing groundwater stress regions - increased pumping can lower the water table

Conclusion:

Give a way forward based conclusion.

Solar irrigation should therefore not be viewed merely as an energy-transition programme, but as a water-energy-agriculture nexus intervention.



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