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Groundwater Based Irrigation for Paddy Farming in Gangetic Plains of India: Consequences and Mitigations

Authors : Dhananjoy Dutta

Abstract : Field studies in lower Gangetic plains of India reveal that over-abstraction of groundwater for irrigation to paddy leads to a substantial depletion of groundwater over the decades, resulting in negative effects on lowering of the water table, drying up of surface water sources and aquifer pollution with leached-out arsenic. The aggravating arsenic toxicity in drinking water is manifested in health problems and 'arsenicosis' of people. A social conflict arises between farmers, who intend to grow paddy for livelihoods, and the groundwater authority, which enacts the 'Regulation Laws' by putting a check on the excessive installation of private tube wells for irrigation. Hence, considering the challenges of resource sustainability, health issues and food security, the study calls for a paradigm shift in policy from further groundwater development to sustainable water resources management and evaluates some strategies integrating supply and demand side management for mitigating the problems.

Keywords : groundwater, irrigation, paddy farming, water table depletion, arsenic pollution, gangetic plains
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