Steering agricultural interventions towards sustained irrigation adoption by farmers

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Agriculture, the largest global freshwater consumer, necessitates water-saving techniques like efficient irrigation. However, the adoption of such technologies is influenced by complex contextual and sociopsychological factors. This study used the sociopsychological RANAS framework to examine the factors impacting irrigation adoption in Maharashtra (India). Logistic regression modeling was conducted with data from cross-sectional surveys in 2019 and 2022, with interim interventions promoting risk-awareness and irrigation technology training. Effects of the interventions on the psychological variables in 2022 were corrected using instrumental variable regression. While micro-irrigation adoption rose from 36.9% to 62.8% (as anticipated), overall irrigation counterproductively decreased from 81.8% to 70.5%. Results indicated that wealth and risk-aversion remained relevant, while self-perceived ability and attitude towards irrigation became non-significant to irrigation adoption. Based on these unintended consequences of the intervention, this study highlights the necessity to also transform attitudes, and promote psychological ownership and trust for sustained irrigation technology adoption behavior.