

## Well Interference and Aftermath: An Economic Analysis of Well Irrigation in Hard Rock Areas of Karnataka

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*It has been brought out by many studies that well irrigation has many advantages over the canal and tank irrigation. However, only a few studies have analysed the interrelated problems of well irrigation. The present paper analyses the impact of well interference in terms of economic equity and sustainability by using field level data collected from well irrigated areas of Karnataka. The study concludes that net income per well and water use efficiency are lower in higher well interfered area compared to low interfered area. The price of water (per unit) pumped out from well is also much higher in well interfered area. Finally, the study suggests that the norms of inter-well distance in relation to groundwater availability should be strictly followed to avoid the adverse problem of well interference. For increasing the water use efficiency under the groundwater constrained situation, drip and sprinkler method of irrigation should be promoted.*

### Introduction

The phenomenon of interactive effect of wells or well interference is the groundwater nexus between wells. Among the connected wells, groundwater withdrawal from one well results in reduction of groundwater yield and water level in the other. There may be either, one well to one well interaction or one well to many wells multiple interactive effects. The interference phenomena are obscure to the extent that one or more number of wells may be causing the problem. Hence, it is proper to study the predicament faced by the farmers due to 'cumulative' well interference, as it is difficult to discern the effect of a specific well on another well. Cumulative refers to the sum total effect of overpumping of groundwater from several (types and numbers of) wells resulting in reduction in the yield and water level in the surrounding wells. The National Geophysical Research Laboratory, Hyderabad, conducted number of tests on pump sets and recorded the discharge and water levels for wells with different inter-well spacings. They concluded that the isolation distance between (i) open well to open well should be 182 meters; and (ii) open well to Dug-Cum-Bore Well (DCBW) or Bore Well (BW) should be 250 meters to avoid the problem of interference. Hence, wells which are spaced below the threshold isolation distance limits prescribed are likely to be more affected from interference than those wells which pass this threshold.

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