

CHOICE OF FUEL FOR IRRIGATION

Pumping is primarily done through electricity. The number of electrified pump-sets has increased to over 16 million in 2009 from 12 million in 1999 (Planning Commission, 2011). The average efficiency of pump-sets remains low at 30-35 percent and offers significant scope for savings. Electricity consumption in the sector grew at a CAGR of about 7 percent between 2006 and 2012, from 90 Terawatt Hour (TWh) to 136 TWh. Diesel pump-sets are estimated to meet about 19 percent of the total pumping energy demand in 2009 and 17 percent of the total energy demand in 2011. The aggregate pumping demand in these years is estimated at 135 TWh and 158 TWh respectively. The share of each fuel, i.e. diesel, electricity, and solar PV in overall pumping requirement is defined as a choice variable, ranging from A to D.

Level A

In Level A, diesel is used to satisfy about 20% of the total irrigation demand due to unreliability of electricity supply and deceleration in the growth of pump-sets energised from the grid. Solar pumping remains too expensive to be used.

Level B

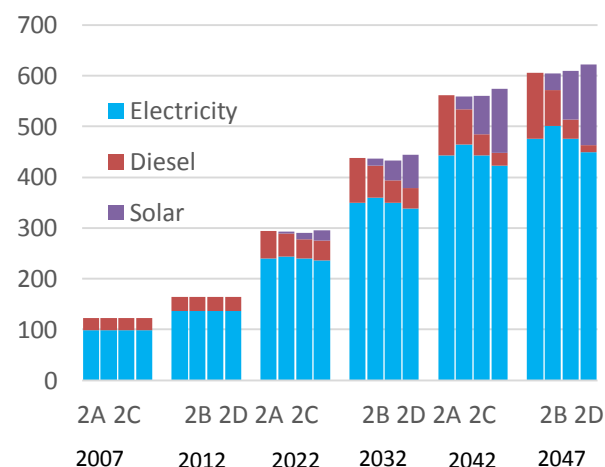
85% of the demand is met through electricity and diesel use is restricted to 10% of the total pumping requirement, owing to de-regulation of diesel prices and reduced diesel subsidy to agriculture sector. Solar penetration reaches 5% as subsidies are channelled towards solar pumping, particularly in regions with rich solar insolation.

Level C

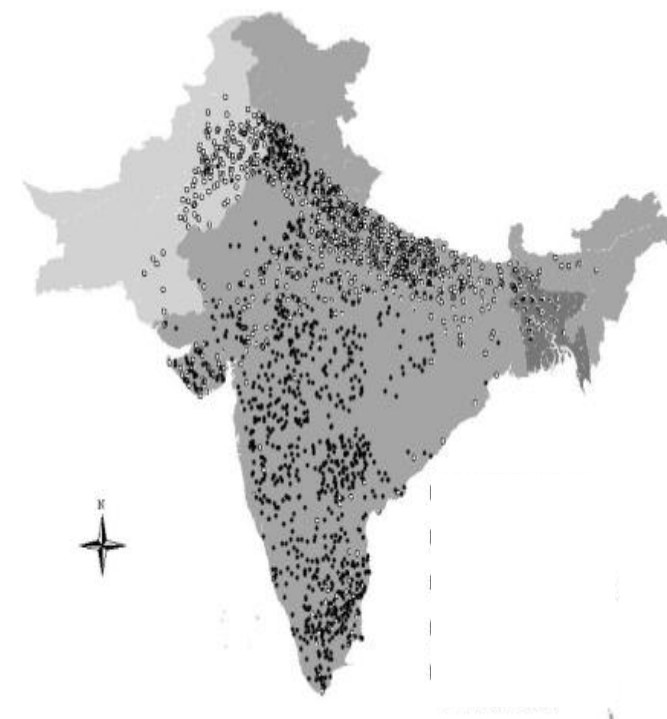
Diesel and electrical shares further reduce by 5 percentage points from level B, and solar is benefitted through large-scale pilot projects, retrofitting and partial removal of fuel subsidies to agriculture sector.

Level D

Diesel is no longer a preferred fuel source due to unfavourable life-cycle economics in level D. 75% of demand is met through electricity and 25% through solar, owing to rapid decline in solar PV module costs and complete removal of electricity subsidies.



Distribution of Pump-Sets In India



Note: Please see detailed documentation for references.