

# Electrification and Crop Diversification: The Impact of Shifting Energy Sources on Cropping Patterns in Bangladesh

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# IMPLICATIONS OF ELECTRIFICATION ON IRRIGATION

## Pumped Up Kicks: Current-ly Electric

- >**Hypothesis:** Electric pumps reduce irrigation costs, altering cropping patterns.
- >**Gap:** Energy source impact on crop diversification is underexplored.
- >**Context:** Post-2010, increased electrification, rising diesel costs, and new groundwater regulations reshaped irrigation.
- >**Impact:** Pump electrification influences broader economic systems.

## Method

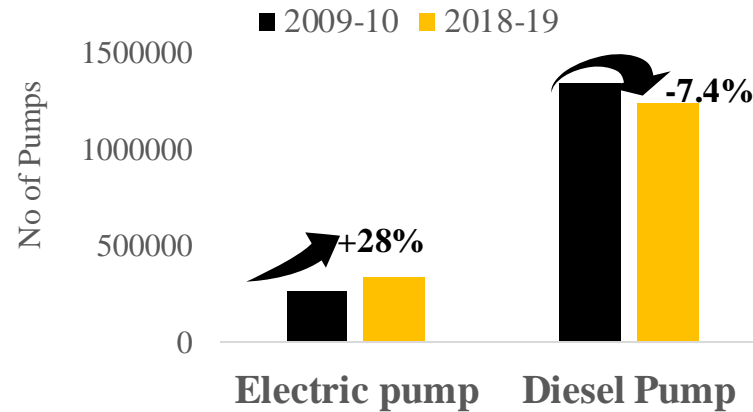
- **Source:** Agriculture Statistics(2008,2019); BADC; BIHS(2011-2018)
- 1)Trend Analysis;2) Panel fixed effect (N=1916);3)DID with kernel Matching (specification):

$$Y_{id} = \beta_1 + \beta_2 X_{id} + \beta_3 TREAT_{id} + \beta_4 P_{id} + \beta_5 TREAT_{id} * P_{id} + \beta_6 G_d + \epsilon_{id}$$

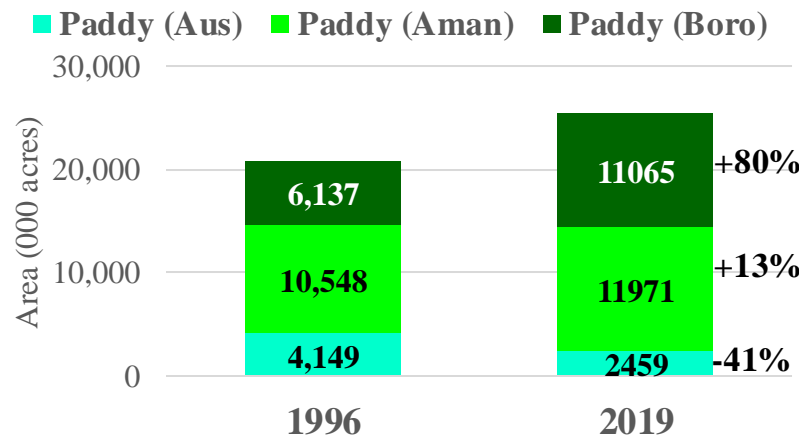
- **TREAT:** 1 if the Household had electricity in 2015/2018, 0 otherwise.
- **P(Post):** 1 for 2018, 0 for 2015.

## Trend Analysis

### (A): Irrigation



### (B): Cropping Pattern



- 23% increase in Cropped Area (1996-2019)
- Paddy area grew by 22.37%; Non-paddy crop area by 26% (1996- 2019)

## Impact of Electrification

Proportions	Change(p.p)	
Paddy	5.5 (p < 0.05)	↑
Paddy(Boro)	7 (p < 0.01)	↑
Non-Paddy	4.9 (p < 0.05)	↓

- **Boro Paddy Increase:** Electrification drives a shift to Boro paddy cultivation
- Findings align with (Buisson et al., 2021) study in West Bengal, which noted paddy intensification following the adoption of electric pumps.

## Electric Dreams, Paddy Schemes!

- **Challenge:** Cheaper electric irrigation drives paddy cultivation over high-value crops.
- **Implication:** Crop diversification toward nutritious crops remains limited.
- **Policy Need:** Interventions must address economic factors to promote diverse crop cultivation.