Rural electrification drives the growth of non-farm work when economic opportunity exists

Fracking, farmers, and rural electrification in India

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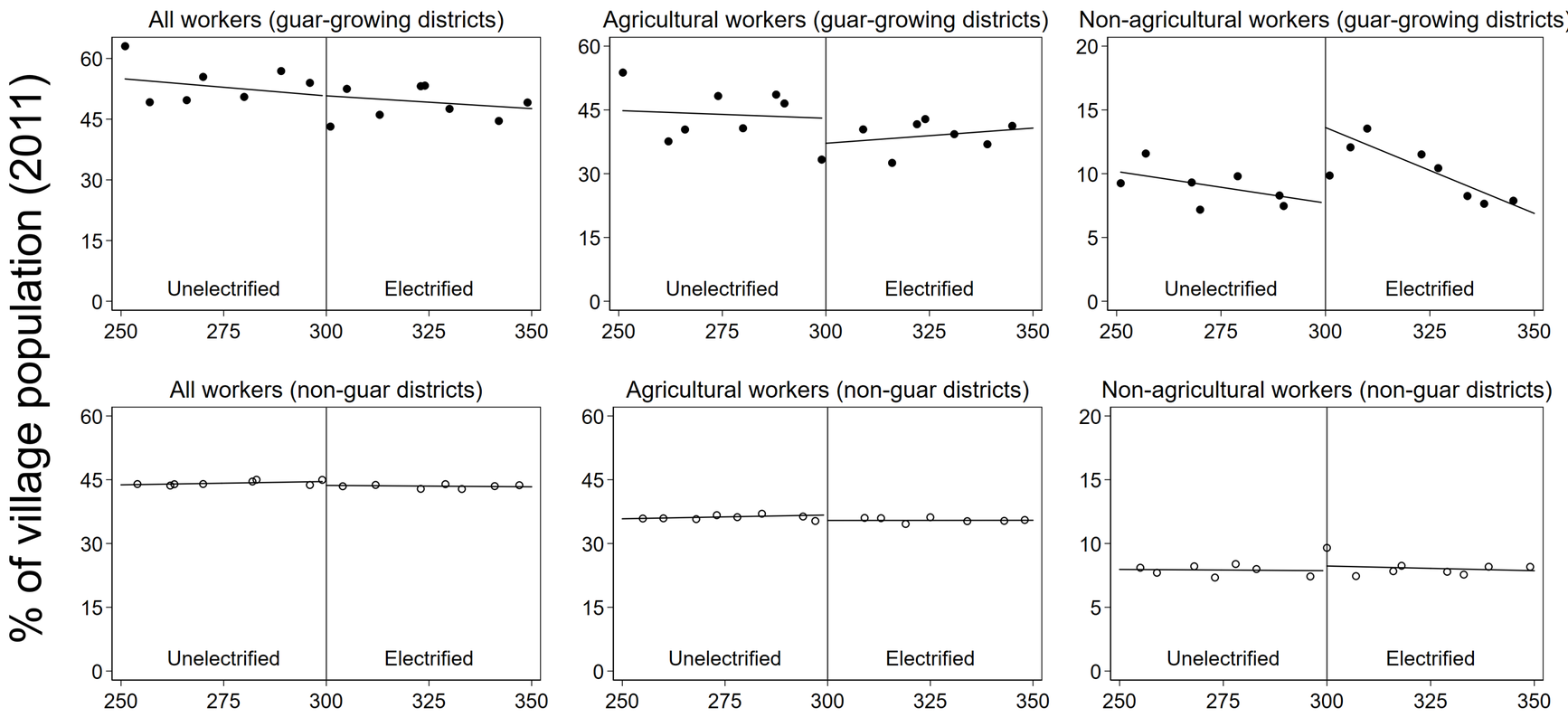
Key points

1. Does rural electrification catalyze job creation? Evidence on its labor-market impacts is mixed.
2. Differences in local contexts and conditions across evaluations may be one reason why.
3. Insofar as these context-specific drivers of impact can be identified *ex ante*, they can help guide spatial targeting of resource-intensive infrastructure investments.
4. We combine two natural experiments to rigorously highlight how local economic conditions drive heterogeneity in the impacts of electrification.

Impact of rural electrification on village-level labor-market outcomes



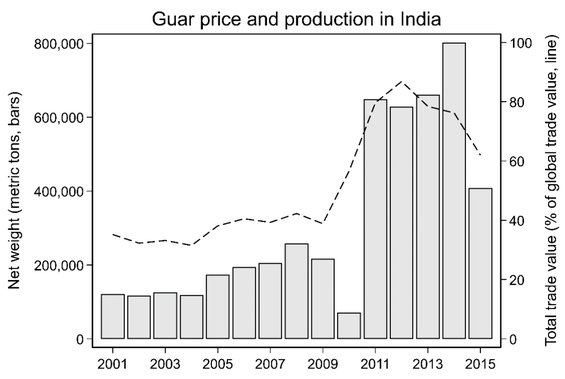
Summary

What connects smallholder farmers in the semi-arid tracts of northwest India to the oil and gas barons of Texas and Oklahoma? A little green bean called guar! The seeds of this humble legume yield a potent thickening agent that greatly enhances the effectiveness of fracking fluid. As the fracking boom started in the United States, demand for guar skyrocketed, resulting in windfall gains for farmers across northwest India, the epicenter of global guar cultivation. Nearly simultaneously, India began rolling out its massive national rural electrification scheme, which prioritized certain villages based on a strict population-based eligibility criterion. We combine these two "natural experiments" to show that large-scale grid electrification can dramatically increase non-agricultural employment in rural economies when economic opportunity complements infrastructure—but if these complementary economic conditions are lacking, the grid may scarcely make a dent.

Empirical design: Discontinuities in electrification combined with exogeneous shock to rural economies

A

B



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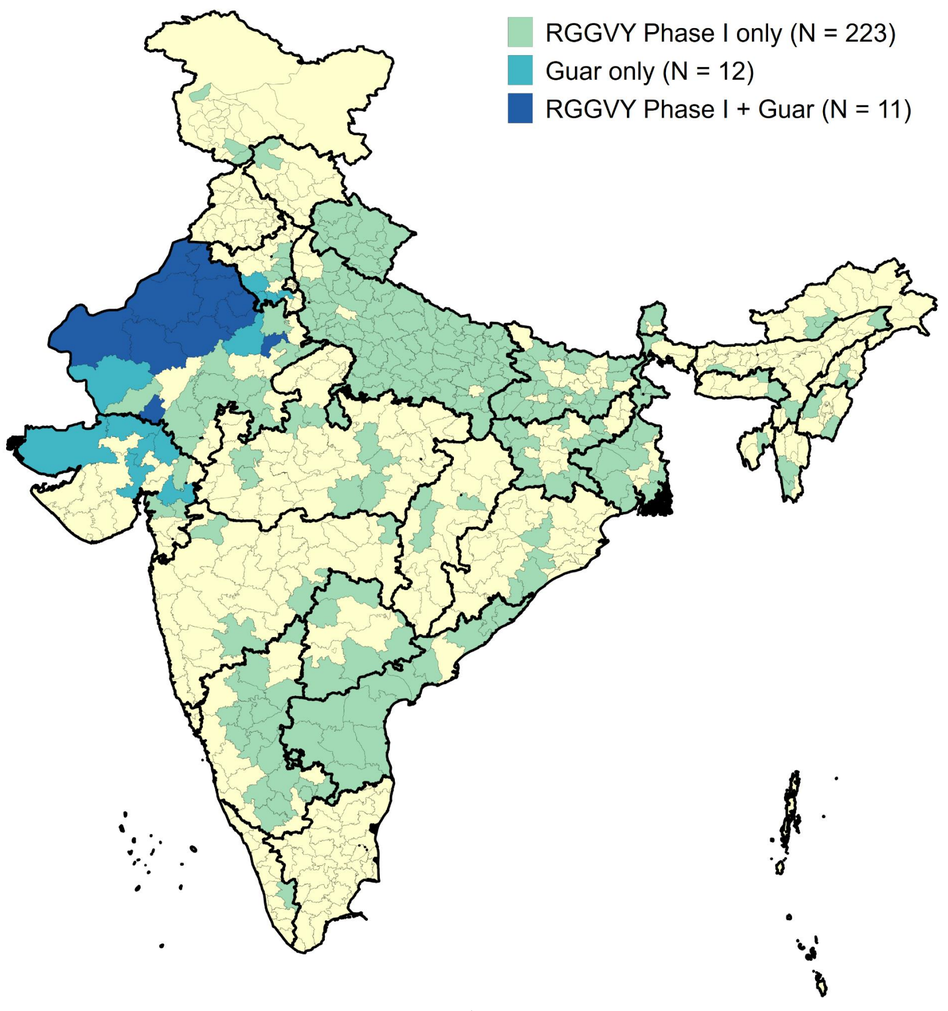

(A) Guar provides an input into the hydraulic fracturing ("fracking") process.
(B) As the fracking boom began in the US, it induced a parallel commodity boom in guar production in India.
(C) Simultaneously, India began to roll out RGGVY, its massive rural electrification scheme, which selected villages for electrification guided by a strict population-based threshold.
(D) We combine the exogeneous economic shock induced by the guar boom with discontinuities in the village-level eligibility criterion for RGGVY within a regression discontinuity (RD) design.

Mechanisms

US fracking boom increases Indian guar production

Electric, labor-saving agricultural technologies adopted more widely in electrified guar-growing areas

But it also increases domestic demand for industrial guar processing

Industrial processing expands more in electrified guar-growing areas