

Are there efficiency costs to
continued land reform
legislation?

The case of West Bengal

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Why land distribution?

- Unequal asset distribution may have side effects
 - Social problems, violence, and disruption
 - Nature of public goods provided
 - Shift in distribution can change equilibrium
- The poor may be caught in a trap
 - Credit market imperfections & indivisible investment
 - Not because they are less productive
 - One-time transfer of wealth can help them escape
- Farm-size productivity relationship
 - Small farms generally more productive than large ones
 - Redistribution will increase productivity of land use
 - This can't be achieved through markets

Land reform in India - types & magnitude

- Tenancy reform
 - Gives permanent use rights to tenants
 - Limits (but does not abolish) rent to be paid
 - Requires quick registration to forestall preventive evictions
 - Sublease generally not allowed; freezes tenancy market
 - Counteracting effect
- Ceiling legislation
 - Land ownership above certain ceiling prohibited
 - To be acquired by state & redistributed
 - Can effectively prevent accumulation; but subdivision possible
 - Major implementation effort needed
- Implementation -> state responsibility
 - Generally slow & lukewarm (picked up in 1970s, then slowed again)
 - West Bengal (operation Barga) the great exception - Operation Barga in 1977: 3.5 mn beneficiaries (50% barga; 50% patta)

Evidence on land reform impact

- National: State level variation
 - Positive impact on poverty but not productivity with no of laws (Besley & Burgess 2002)
 - Not robust (yields); possibility of equity-efficiency trade-off (Ghatak 2006)
- Land reform in West Bengal
 - Operation Barga significantly raised productivity – by 60% (Banerjee et al. 2002)
 - Positive productivity but effect much smaller (Bardan and Mookjee)
- Limitations
 - Some measures/results controversial
 - No individual-level effects
 - Short-term effects only – little evidence on poverty traps or cost

Data and approach

- **Motivation**
 - Government interest to give permanent tenant rights
 - Need to assess potential economic benefits
 - Obtain sample frame to get owner-cum tenants
- **Listing in 200 villages in 2005**
 - About 95,000 households (pattadars & bargadars)
 - Education by all dynasty members (900,000 individuals)
 - Includes 78 head, parents, siblings, off-spring
- **Household Survey in 2008 (listing as sample frame)**
 - 1700 households, oversample bargadas households
 - Assess whether there is Marshallian inefficiency for Barga Land.
 - Identification strategy: comparing productivity and input use intensity between own land and barga land cultivated by the same household.

Empirical Model

The basic econometrics model is specified as:

$$Y_{ij} = \alpha_i + \beta R_{ij} + \delta Z_i + \theta X_{ij} + \varepsilon_{ij}$$

Where

- Y_{ij} is either a productivity measure (yield/gross value per acre/net value per acre) or input use intensity
- R_{ij} is a dummy variable for barga land
- Z_i is a vector of household characteristics
- X_{ij} is a vector of plot level characteristics including location and land quality of the plot.
- α_i is the unobserved household fixed effect
- β, δ, θ are parameters to be estimated

Ordinary Least square estimates are biased due to the presence of α_i . We estimate the model by household fixed effect using plot level data.

Household characteristics & targeting

- **Beneficiaries' initial conditions**
 - Backward castes and landless (for patta)
 - Worse living conditions (walls, floors)
 - Less physical (bullocks, bicycle) & human capital assets
 - In line with other literature (good community control)
- **Beneficiaries' current conditions**
 - Landlessness significantly reduced
 - Still less income per capita than non-beneficiaries
 - Significant catch up in education by women
- **Productivity of land use**
 - Productivity significantly lower than average
 - Low productivity of patta is likely to be associated with poor land quality
 - Low productivity of barga beneficiary may be due to incentive (need rigorous regression analysis using plot level data)

Table 1: Household characteristics & targeting

	Total	Unaffected	Bargadars	Pattadars
1978 (initial conditions)				
SC/ST	0.45	0.43	0.56**	0.73**
Landless	0.57	0.57	0.55**	0.75**
Bad roof (thatch/plastic/mud)	0.72	0.70	0.83**	0.90**
Bad wall (mud/bamboo)	0.70	0.69	0.85**	0.78**
2008 (current condition)				
Landless	0.51	0.57	0.38**	0.03**
Income per capita	5,468	5,545	4,640**	4,400 **
crop productivity (Rs./acre)	7,241	8,079	6,328 **	3,435 **
No. of obs. (households)	95,924	81,958	6,838	5,921

Econometric evidence

- Productivity is significantly lower in barga land.
- Depending on the productivity indicators and model specifications, the productivity of barga land is 10 percentage points to 25 points lower than own land.
- Part of the low productivity is explained by the lower input intensity use and partly is due to the less intensive land use (more crop seasons for own land than barga land)

Productivity Differences Between Barga Land and Own Land (Value per annum)

	Annual Gross Value		Annual Net Value	
Plot Area	-0.031*** (0.009)	-0.037*** (0.008)	0.008 (0.010)	0.003 (0.010)
Barga Land	-0.211*** (0.011)	-0.155*** (0.011)	-0.208*** (0.013)	-0.164*** (0.012)
Irrigation		0.640*** (0.017)		0.524*** (0.020)
No. of plots	9103	9059	8997	8955
R-squared	0.052	0.224	0.036	0.130
No. of hhs	1772	1772	1769	1769
Soil Controls	NO	YES	NO	YES
Fixed Effects	YES	YES	YES	YES

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Regressions include soil information on soil type (soil color), soil salinity, and rate of percolation, drainage, and soil characteristics.

Productivity Differences between Barga Land and Own Land (Value per season)

	Gross Value		Net Value	
	Kharif	Rabi	Kharif	Rabi
Plot Area	-0.031*** (0.005)	-0.007 (0.012)	0.001 (0.006)	0.0410** (0.017)
Barga Land	-0.078*** (0.006)	-0.136*** (0.016)	-0.083*** (0.007)	-0.142*** (0.021)
Irrigation	0.002 (0.010)	0.142*** (0.036)	0.010 (0.011)	-0.053 (0.049)
Observations	8277	4638	8206	4409
R-squared	0.034	0.043	0.025	0.028
No. of HHs	1649	1222	1643	1192
Soil Controls	Yes	Yes	Yes	Yes
Fixed Effect	Yes	Yes	Yes	Yes

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Regressions include soil information on soil type (soil color), soil salinity, and rate of percolation, drainage, and soil characteristics.

Input Use Intensity between Barga Land and Own Land (Annual)

	Input Cost	Casual Labor	Family labor	Fertilize & Manure	Pesticide	Bullock	Tractor	Transport
Plot Area	-0.112*** (0.009)	1.583*** (0.029)	0.642*** (0.008)	-0.135*** (0.009)	-0.154*** (0.009)	-0.030*** (0.004)	-0.114*** (0.010)	-0.075*** (0.006)
Barga Land	-0.106*** (0.012)	-0.151*** (0.035)	-0.0220** (0.011)	-0.140*** (0.012)	-0.069*** (0.011)	-0.005 (0.005)	-0.012 (0.013)	0.011 (0.008)
Irrigation	0.903*** (0.019)	0.448*** (0.054)	0.496*** (0.017)	0.740*** (0.019)	0.553*** (0.018)	0.033*** (0.008)	0.304*** (0.021)	0.082*** (0.012)
No. of plots	9129	9100	9120	9129	9129	9129	9119	9129
R-squared	0.29	0.39	0.49	0.55	0.81	0.89	0.09	0.89
No. of hhs	1777	1334	1734	1777	1777	1777	1104	1777
Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Soil Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Regressions include soil information on soil type (soil color), soil salinity, and rate of percolation, drainage, and soil characteristics.

Conclusion & implications

- Considerable Marshallian inefficiency
 - Making tenancy rights permanent may help productivity in short run
 - ... however is not the most efficient long-term arrangement
 - The inefficiencies are likely to increase over time as the original beneficiaries get old and their children are less interested in farming.
 - The inefficiency is also larger if we consider its potential negative effect on long-term investment and rental transfers.
 - Ways to give ownership rather than tenancy rights to be considered. Knowledge of the cost associated with the conversion is needed before concrete recommendation can be made.

Next Step

- More careful econometrics methods for the current analysis. For example, a tobit fixed effect model will be used to estimate the input intensity use to take care of the zero input use.
- Impact on long-term investment based on the survey data
- Effect on household broader welfare indicators by comparing beneficiary households and non-beneficiary households.
- Impact on market transactions