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Abstract

This article looks into the role of land reform in comparison to concentric effort to augment agricultural GDP. Redistributive land reform policy aims to improve land endowments of poor, though varies among states in respect to political will and implementation. Panel data of fifteen main states from 1980 to 2003 is used to understand whether land reforms have any appreciable impact on reducing rural poverty. An examination of effect of land reform along with agricultural GDP on rural poverty suggests that decrease in land concentration has greater impact on reducing rural poverty. A policy with combination of equitable economic progress and redistributive efforts is advocated.

Key words: land reform, poverty, agricultural income, state, India

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1 Introduction

For several decades the role of agricultural growth in alleviating rural poverty has remained in the centrality of the policy debate on poverty alleviation. Several studies (for details, see Agarwal, 2008) have put reliance on economic growth and in turn on 'trickledown effect' as a major driving force towards a poverty free world. Todaro and Smith (2006: 255) noted that economic progress alone will not result into "improved living standards for the very poor". This necessitates public spending (Fan *et al*, 2000), redistributions (Tyler *et al*, 1993; Deininger *et al*, 2009) as well as appropriate institutional arrangement (Acemoglu *et al*, 2001).

Over the years various poverty measures have been evolved to monitor socio economic condition of target group and also to check the progress of development programmes or, policy initiatives. Head count ratio (HCR) is the proportion of the population living below poverty line. The poverty gap (PG) measures the amount of money by which each individual falls below the poverty line. Squared poverty gap index (SPG) as proposed by Foster, Greer and Thorebecke (1984) is mean of the squared proportionate poverty gap. While HCR has its shortcomings in respect to PG and SPG but still been widely used probably because of wide availability of data needed for its derivation and because it allows easy understanding of the most immediate dimension of poverty by the policy makers. We also use HCR for our study of rural poverty.

2 Relationship between land reform and rural poverty

In this section we present econometric analysis of relationship between land reform and poverty in rural areas, using panel data of three time periods across 15 major states of India. This paper studies land reform as redistributive policy where efforts have been directed towards implementing land ceiling and distributing surplus land among the landless. Inequality in land ownership has been captured in terms of Gini coefficient of concentration of land ownership. India being a country holding 17.5 percent of world population[1] and a third of world's poor with considerable variation in socio-economic condition across states calls for state wise analysis. The trend of head count ratio in rural areas (HCRR) across the included states (Table 1) highlights the variation.

The hypothesis underlying this study is poverty in rural areas reduces with increase in real agricultural GDP per rural population and increases with rise in land concentration. We accept that though 'agriculture' and 'rural' are not synonymous, agriculture being prime occupation in rural India the error to be caused by the assumption that 'agriculture' and 'rural' are synonymous would be minor.

Table1. Trend of head count ratio in rural areas across major Indian states

States/Year	1983	1993-1994	1999-2000
Andhra Pradesh (AP)	26.53	15.92	11.05
Assam (AS)	42.6	45.01	40.04
Bihar (BR)	64.37	58.21	44.3
Gujarat (GU)	29.8	22.18	13.17
Haryana (HA)	20.56	28.02	8.27
Karnataka (KA)	36.33	29.88	17.38
Kerala (KE)	39.03	25.76	9.38
Madhya Pradesh (MP)	48.9	40.64	37.06
Maharashtra (MH)	45.23	37.93	23.72
Orissa (OR)	67.53	49.72	48.01
Punjab (PB)	13.2	11.95	6.35
Rajasthan (RJ)	33.5	26.46	13.74
Tamil Nadu (TN)	53.99	32.48	20.55
Uttar Pradesh (UP)	46.45	42.28	31.22
West Bengal (WB)	63.05	40.8	31.85
All India	45.65	37.27	27.09

Source: Planning Commission, Govt. of India

The sources of data on head count ratio, per capita agricultural Gross State Domestic Product (GSDP) and land concentration is provided in Appendix. Data estimates correspond to years 1981 to 1984, 1991 to 1994 and 1999 to 2003. This is due to lack of uniformity in data availability on a particular time point. We expect that as the variables included in the study experiences slow movement, data set within a narrow period range would yield minor difference in result. While we admit that the study suffers from its limitation of following repeated measures design, the same may be attributed to lack of time series data on some of the variables included[2]. In this study, the dependent variable is state-wise head count ratio of rural population (HCRR), while, independent variables are real agricultural GSDP per capita rural population (YA) and Gini

coefficient of concentration of land ownership[3] (GLOW). As inclusion of price variables like inflation and relative prices[4] have evoked certain amount of controversy (Ahluwalia, 1986; Sen, 1986; Desai and Namboodiri, 1997) and further as they found to have very limited role in alleviating rural poverty (see Desai and Namboodiri, 1998) this study excludes the same. The weak effects of growth of non-agricultural economy on rural poverty found by several researchers (see Eswaran and Kotwal, 1994; Ravallian and Datta, 1996, 1998; Desai and Namboodiri, 1998) have made the authors to exclude per capita non-agricultural GSDP as an independent variable.

The best fit equation under Ordinary Least Squares assumptions is fixed effect least square dummy variable (LSDV) model as follows:

$$HCRR_{it} = 0.280 + \alpha_1 D_{APi} + \ldots\ldots + \alpha_{14} D_{UPi} - 0.020\ YA_{it} + 1.037\ GLOW_{it} \quad (1)$$

(2.14) (1.66) (3.71)

$R^2 = 0.85$

where, i stands for i^{th} cross sectional unit (i =1,2, .., 15); t stands for t^{th} time period (t = 1,2,3); D_{APi} = 1 if the observation belong to AP otherwise 0.

Table 2. Determinants of poverty in rural areas

	Head count ratio	Head count ratio	Head count ratio	Head count ratio
Intercept	0.280**	0.381***	0.318**	0.297***
	(2.14)	(3.41)	(2.56)	(2.90)
D_{APi}	-0.524***	-0.445***	-0.494***	-0.497***
	(5.42)	(4.88)	(5.12)	(5.58)
D_{ASi}	0.003	0.014	0.013	0.015
	(0.05)	(0.26)	(0.21)	(0.26)
D_{BRi}	-0.059	-0.061	-0.062	-0.049
	(0.85)	(0.99)	(0.92)	(0.78)
D_{GUi}	-0.629***	-0.571***	-0.602***	-0.601***
	(6.29)	(6.22)	(6.13)	(6.38)
D_{HAi}	-0.490***	-0.329**	-0.414***	-0.417***
	(3.40)	(2.39)	(2.75)	(3.20)
D_{KAi}	-0.433***	-0.351***	-0.401***	-0.414***
	(4.18)	(3.65)	(3.91)	(4.47)
D_{KEi}	-0.137**	-0.114*	-0.119*	-0.115*
	(2.13)	(1.97)	(1.91)	(1.91)
D_{MPi}	-0.339***	-0.289***	-0.321***	-0.323***
	(3.55)	(3.30)	(3.43)	(3.64)
D_{MHi}	-0.419***	-0.329***	-0.390***	-0.378***
	(3.72)	(3.12)	(3.53)	(3.60)
D_{ORi}	0.006	0.017	0.020	0.012
	(0.09)	(0.29)	(0.31)	(0.20)
D_{PBi}	-0.566***	-0.370**	-0.483**	-0.512***
	(2.98)	(2.14)	(2.54)	(3.31)
D_{RJi}	-0.527***	-0.424***	-0.479***	-0.486***
	(4.86)	(4.05)	(4.31)	(4.78)
D_{TNi}	-0.220***	-0.145**	-0.196***	-0.209***
	(3.15)	(2.37)	(2.82)	(3.22)
D_{UPi}	-0.175**	-0.179**	-0.158**	-0.156**
	(2.61)	(2.79)	(2.40)	(2.46)
Current real agricultural GSDP per rural capita (YA_{it})	-0.020*			
	(1.66)			
One year lagged real agricultural GSDP per rural capita (YA_{it-1})		-0.033***		
		(3.19)		
Two year lagged real agricultural GSDP per rural capita (YA_{it-2})			-0.026**	
			(2.16)	
Three year lagged real agricultural GSDP per rural capita (YA_{it-3})				-0.023**
				(2.70)
Gini coefficient of concentration of land ownership ($GLOW_{it}$)	1.037***	0.837***	0.955***	0.977***
	(3.71)	(3.25)	(3.44)	(3.87)
R^2	0.8539	0.8824	0.8624	0.8726
$F_{(14,28)}$	6.53	7.02	6.40	6.96

Notes: Absolute value of t statistics in parentheses. *significant at 10 per cent; **significant at 5 per cent; ***significant at 1 per cent.

Fixed effects at the state level control the existing differences across states in history of political economy, administrative functioning and as well as in land reform[5].

West Bengal has been taken as base state in the analysis to avoid perfect collinearity. In other words, 0.280 represents the intercept of WB and α_1 to α_{14}, the differential intercept coefficients highlight by how much the intercepts of respective states differ from the intercept of WB. Most of the differential intercept coefficients are significant at conventional level (refer Table – 2).

It is worth noting that the simple correlation coefficient between YA_{it} and $GLOW_{it}$ is 0.31. Thus, there lies a small positive correlation in the sample between real agricultural GSDP per rural capita and land concentration.

The signs corresponding to YA_{it} and $GLOW_{it}$ extend support to our hypothesis. The coefficient of determination (R^2) indicates that 85 per cent of variability in rural head count ratio could be explained by this model. Since, real agricultural GSDP per rural capita are likely to have effects over time and not necessarily during the current period the study also examines lagged effect of the same on rural poverty. The models with one, two and three years lagged values of YA also confirm the hypothesis (refer Table-2). Explanatory power of these models ranges between 86 to 88 per cent. Besides, most of the coefficients being significant, F statistics also indicates overall significance of each model.

From equation (1) we find that while negative sign of YA_{it} is as expected, the coefficient is significant only at 10 percent level. As regards $GLOW_{it}$, coefficient with positive sign confirms our hypothesis and coefficient is highly significant. Thus, relationship of rural poverty with land concentration is stronger statistically than in case with YA_{it} and coefficient is of a much greater magnitude. But to note that this study has not included financial cost of land reform while deriving this result.

3 Implications

The study brings back the argument of importance of reduction in land concentration for reducing rural poverty. This highlights that overemphasis on economic progress is insufficient to alleviate rural poverty. It is evident that there is need for balanced policy which will not isolate land redistributive measures from economic progress. The discussion on positive impact of land redistribution on reduction of rural poverty is dominated by the findings of inverse relationship between farm size and yield, where small farms exceeds their larger counterpart in terms of yield (see Berry and Cline, 1979; Rosenzweig and Biswanger, 1993; Biswanger *et al.*, 1995; Dudwick *et al*, 2007). This suggests that higher yield leads to greater farm production and improves family welfare through higher consumption as well as through additional income from sale of marketable surplus. Less ambitious land reforms tend to limit these positive effects of land redistribution.

Notes

1. As per the estimates of 2007 provided by United Nations (2007).
2. For more details please refer Appendix.
3. Gini coefficient of concentration of land ownership:

   $G = 1 - [\Sigma(P_j - P_{j-1})(q_j + q_j\text{-}1)]/10^4$, where P_j and q_j are respectively the cumulative percentage of number of ownership holdings and area operated in the j^{th} size class of holdings.
4. Prices paid in comparison to prices received by an individual.
5. Refer Besley and Burgess (2000) for a detailed scrutiny of policy interventions in land reform across states.

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Appendix

Data source for HCRR, YA and GLOW

Head Count Ratio estimates of rural poverty (HCRR)

All estimates correspond to the years 1983, 1990-1991 and 1999-2000 are by expert group method and published by Planning Commission, Government of India. The data for the years 1983 and 1990-1991 has been taken from Sen, A. (1996), while data for 1999-2000 was quoted in Deaton, A. (2003).

Since three states, namely, Bihar, Madhya Pradesh and Uttar Pradesh, were bifurcated in 2001, the published report for 2004-2005 (61st round of National Sample Survey) provides data for the bifurcated states separately. To include the comparable variables the study takes state wise data of HCRR from 1999-2000 report which provides data prior to bifurcation rather than from 2004-2005 report.

Gini's coefficient of concentration of land ownership (GLOW)

The Gini coefficients corresponding to years 1982, 1992 and 2003 for 15 major states have been calculated from the data provided in National Sample Survey Report No. 491. Household Ownership Holdings in India, 2003, Statement 5.

Agricultural GSDP per rural capita (YA)

The agricultural GSDP for the 15 states was taken from "Domestic Product of States of India: 1960-61 to 2006-07" published by the Economic and Political Weekly Research Foundation. The data from 1980-1981 to 1992-1993 was taken at constant price with 1980-81 prices as the base year and the data from 1993-1994 to 1998-99 was taken at 1993-94 prices. The two GSDP series were then adjusted separately by multiplying with appropriate factors to get the agricultural GSDP at 1999-2000 prices. The GSDP data for 1999-2000 and 2000-01 was taken directly at 1999-2000 base.

The data on rural population for census years i.e., 1981, 1991 and 2001 has been taken from the census reports. For the non census year's interpolated data has been obtained from data bank of Centre for Monitoring Indian Economy. The rural-urban ratio of the population has been taken to be the same for 5 years before and after the census. Accordingly, the ratio is same as that of 1991 and 1996 onwards it is the ratio of 2001 which has been used. These ratios have been then used to calculate the rural and urban population across the states for the given time period. Once the state-wise rural population was available, the per capita rural agricultural GSDP was obtained by dividing the agriculture GSDP with the rural population.