Poverty Impacts of India's National Rural Employment Guarantee Scheme: Evidence from Andhra Pradesh

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1. Introduction

India's National Rural Employment Guarantee Scheme (NREGS), implementation of which started in 2006, based on the 2005 National Rural Employment Guarantee Act (Ministry of Law and Justice 2005), is probably the largest social safety net program in the world.

Not surprisingly for a program of this magnitude, the NREGS has been controversial. Supporters point to high awareness of the program, participation rates, especially by females (>50%) that are significantly above those achieved by earlier programs, and anecdotal evidence highlighting that the program has contributed to decentralization, transparency of local political processes, and served as an important safety net (Khera and Nayak 2009; Drèze and Khera 2009; Jandu 2008). Critics point to the program's high cost, low efficiency, and serious corruption (eg., Niehaus and Sukhtankar 2009). The facts that EGS job opportunities may be too limited to meet the demand at the start of the scheme and the fact that the daily wage of EGS is higher than the market wage for casual labor may cause leakage of the scheme fund to unintended group. Furthermore, possible corruption in the implementation of the scheme makes it more difficult for EGS to actually reach its target group, up to the point where the intended benefits may not materialize at all. Therefore, empirical work on the targeting of EGS as well as impacts on EGS on participants will be desirable.

This paper studies the targeting of NREGS and how NREGS affects some major welfare indicators on its direct beneficiaries. We use the data from some 2,500 households in Andhra Pradesh (AP) who were surveyed in 2004 before NREGS had been conceived, in 2006 when implementation had just started, and in 2008 when NREGS operated state-wide. These are combined with detailed administrative data on NREGS roll-out and work records. Our empirical

results suggest that NREGS targets the poor. However, a higher propensity of participation for households playing a leadership role in the village points towards some influence of village leaders in allocation of work. A lower participation propensity for illiterate and female-headed households also suggests that awareness of the program or other constraints on the ability to supply labor continue to be relevant. Our results also point towards significant and positive impacts of NREGS participation on consumption expenditure, intake of energy and protein, and asset accumulation, which suggest the short term effects of NREGS on participating households were positive and greater than program cost.

The paper is structured as follows. Section 2 describes key features of NREGS and its implementation in Andhra Pradesh. Section 3 describes data source and summary statistics. Section 4 presents the results on program targeting. Section 5 presents estimation results of program impacts on poverty. Section 6 concludes.

2. Key Characteristics and Implementation of NREGS

While building on earlier a long tradition of food for work schemes, NREGS goes beyond them in a number of important respects, namely (i) for the first time households are provided with a legal right to be employed up to 100 days a year per household and individuals are entitled to receive the wages if no work is made available to them within two weeks of an application; (ii) a minimum wage rate is set at the state level and contrary to what is practice in rural India, the same wage is paid to males and females, a feature which, together with the fact that amenities such as crèches have to be provided at worksites, is viewed to make NREGS contribute to female empowerment; (iii) payment is to be made promptly in cash or into bank accounts, thus

providing opportunities for linking the poor to the banking system; (iv) there is a heavy focus on irrigation, minor roads, and land improvement to boost returns to labor at the local level; and (v) implementation is decentralized to local governments (*panchayats*) to ensure that works undertaken are actually productive with considerable control by village assemblies (*gram sabhas*), social audits, and the ability to check employment records by each individual through a website, to minimize corruption. The program was rolled out in three phases, starting with the most backward districts, to achieve full national coverage in 2008. Quantitative accomplishments are impressive: As of Dec. 2009, NREGS supported a total of 42 million households who put in 1.95 billion work days on 3.3 million projects.

In Andhra Pradesh, NREGS was implemented by three phases: Thirteen districts started to have to access to NREGS in 2006 in Phase 1; Phase 2 of EGS involved six more districts in 2007; The remaining three districts were covered in 2008 when Phase 3 started. According to the Operational Guidelines (Ministry of Rural Development 2008), in order to participate in EGS, qualified households need apply for registration to the local Gram Panchayat (village government, GP thereafter) under the supervision of the GP chief executive (the *Sarpanch*). A register maintained at the GP will be sent to the Block Computer Centre (MCC) for entry of the wage seeking household information. The MCC allocates a Job card ID and a Job card will be generated for each household and handed over to the GP. The GP completes the job card by affixing the photograph of all adult members of the household and hands it over to the household. The job card should be delivered to households free of charge within 15 days of the application. Once the job card is issued, the household can indicates to GP how many days (<=100 days) and when he/she would like to work under EGS for the following year. Based on the demand of households and the recommendations from Gram Sabha (village meeting), the GP writes a

proposal on work plan and submits to the Intermediate Panchayat (block/mandal government) who is responsible to consolidate GP plans at the Block level into a Block Plan and submit to the District Panchayat (district government). The projects are sanctioned at the district level (Is this correct?) and the allocation of work among job seekers is mainly the responsibility of GPs.

Following the work allocation, job card holders go to the work site and perform the work. A weekly Work Progress Report along with the Muster Roll prepared by the Para-worker (local contractors hired by the program) will be submitted to the Block MCC. At the MCC, attendance is captured from the submitted Muster Roll. The data is validated and stored in the database. Based on the reported progress of work and the number of person-days spent, payment to the workers is computed and a Wage List is generated. The generated wage list is then sent to the GP and the paying agency can be either the village Panchayat or Post Office, Post Office savings account or Bank account whichever is convenient to the wage seeker.

To make sure that schemes are being implemented as planned, government of Andhra Pradesh has started the implementation of social audits since July 2006. All districts in Phase 1 had been covered by the end of 2008. The so-called social audits are the audits with active involvement of the primary stake holders. During social audits, several frauds have been uncovered and punished. For example, some EGS organizers have embezzled money by "creating fake muster rolls, inflated bills, exaggerated measurements, and non-existent works, all through bribes and cuts from wage seekers". The total amount recovered is around Rs 2.50 cr so far. Furthermore, the government of Andhra Pradesh has made important EGS information available online so that it can be accessed by everyone at anytime. The increased transparency makes it easy to trace every participant and every payment under EGS thus increases the potential cost of corruption.

The transparency and publication of information significantly facilitates our analysis.

3. Data

Our analysis is mainly based on a three-round household survey conducted in 2004, 2006 and 2008, respectively. Five districts were chosen to represent all the state's macro-regions (Rayalaseema, Telangana, and Coastal AP). Villages were randomly selected in these districts, and then households in these villages. The household questionnaire which was complemented by questionnaires at village levels, consisted of male and female parts administered separately -and as far as possible simultaneously- to the main male or female person in the household, normally the head and spouse.[1]. The survey covers about 4300 households in 480 villages. Out of the five sampled districts, three are Phase 1 districts (Kadapa, Warangal, and Nalgonda) that started to access EGS in 2006, one is Phase 2 district (Nellore) that started in 2007, and one is Phase 3 district (Visakhapatnam) that started in 2008.

The household survey provides information on important welfare indicators including consumption, nutritional intake, and assets. Consumption includes food and non-food consumption over the past 30 days and more lumpy items over the past year.[2] We compute the amount of calories and protein consumed by multiplying physical quantities of more than 30 food items in the questionnaire's consumption section each with their caloric and protein content based on the main reference for Indian foods (Gopalan *et al.* 2004).[3] Non-financial assets include

[1] For example, information on health, consumption, and female empowerment, among others, was obtained from the female while information on agricultural production was obtained from the male.
[2] Although the survey instrument is less disaggregated than that used by the National Sample Survey (NSS), it follows the overall structure used there.
[3] For fruits or vegetables where the survey includes only aggregate spending, we use the 55th round of the National Sample Survey (NSS) to derive the price and caloric content of a representative basket of these consumed in Andhra Pradesh.

consumer durables, productive, and livestock assets.[4] Throughout, consumption and asset are expressed in per capita terms based on adult equivalent measures.[5] We also have information on household demographics and poverty category. The poverty category is based on a census the state's 2001 "below poverty line" census which is routinely used to determine eligibility for government programs complemented by a large effort of "participatory identification of the poor" that added vulnerability and social exclusion to quantitative census indicators. Each household is assigned to one of the four categories: the poorest of the poor (POP), poor, not so poor, or non-poor.[6]

The other part of data we use are online administrative data which include job card information for each wage-seeking household, muster roll information (such as wage rate, total amount paid, total work days, etc) for each worker, and each EGS work completed or in progress. Table 1 summarizes the types of EGS work completed by 2006, 2007, and 2008 for each phase. Irrigation and land improvement are the two most common type of EGS work, which had been taken by 76% and 75% of all villages in Phase 1 districts by 2008. Only 20% villages had taken road construction by 2008 in Phase 1 districts.

The third round of the household survey includes information on job card number for each

[4] Financial assets were excluded due to concerns about misreporting. Asset values were measured as in December 2003 in the 2004 survey, in June 2006 in the 2006 survey, and in XXX in the 2008 survey.

[5] The adult equivalent measures for caloric and protein consumption are obtained using nutritional requirements by sex and age as weights, i.e., weights are 1.2 for adult males, 0.9 for adult females, 1.0 for adolescents (12 to 21 years), 0.8 for children aged 9 to 12, 0.7 for children aged 7 to 9, 0.6 for children aged 5 to 7, 0.5 for children aged 3 to 5, and 0.4 for children younger than 3 (Gopalan *et al.* 2004). For income and overall consumption, we assign weights to be 0.78 for anyone older than 60 or younger than 14.

[6] The manual used in the process defines "POP" as those who can eat only when they get work and who lack shelter, proper clothing, respect in society, and cannot send their children to school; "The poor" have no land, live on daily wages, and need to send school going children to work in times of crisis. The "not so poor" have some land, proper shelter, send their children to public schools, are recognized in society, and have access to bank credit as well as public services. The non-poor, having land of at least 5 acres, no problem for food, shelter, clothing, can hire laborers, send children to private schools, use private hospitals, lend rather than borrow money, and have considerable social status.

household, based on which we merge the household survey data with the online administrative data. This allows us to learn about who worked under NREGS for how many days in our sample. Table 2 summarizes job card distribution and actual NREGS participation by household poverty category. By the end of 2008, about 53% POP households and 56% Poor households are job card holders, compared to 44% of Not-So-Poor households and 28% Non-Poor households in the Phase 1 districts. This suggests the self-targeting mechanism of EGS takes effect. However, the actual participation rate of EGS (defined as having worked under EGS) is only 17.1% In Phase 1 districts, 11.2% in Phase 2 district, and 4.7% in Phase 3 district by 2008.

Table 3 summarizes household welfare indicators in Phase 1 districts by participation status in 2004, 2006, and 2008 respectively. Participants refer to the households with at least one member who had worked under EGS by the end of 2008 when the third round survey was conducted. Not surprisingly, the participants of EGS had lower consumption, assets, and energy and protein intakes than non-participants in each of the three years.

4. Targeting of EGS

As discussed earlier, being a direct beneficiary of EGS involves two steps: obtaining a job card and being assigned for work. Although we have no information on job card application, we can see from Table 1 that only a small percentage of job card holders have actually worked under EGS even for Phase 1 Districts. This observation suggests that the supply of EGS work cannot meet its demand so far, which is in line with our observation from the field visits. The summary statistics from Tables 1 and 3 both suggest that EGS participants are poorer than non-participants on average, which is in line with the self-targeting mechanism of EGS. To further examine the

targeting of EGS, we run a Logit regression of EGS participation in Phase 1 districts.[7] The dependent variable is 1 if the household is worked under EGS and 0 otherwise. Household demographics (location, caste, female headship, occupation and literacy), leadership in the village, and initial economic conditions (poverty status, consumption, nutritional intake, and non-financial assets) serve as explanatory variables. The summary statistics of the explanatory variables for participants and non-participants as well as the logit regression results are reported in Table 4. The pseudo R-squared is 5%, which suggests a relatively low explanatory power of the explanatory variables. This is expected because self-selection plays an important role in EGS participation.

The results point to a higher propensity of participation for households being POP or Poor, having a member who is casual laborer, belonging to scheduled caste, being literate, headed by male, taking a leadership in the village, and having an initially lower consumption. The results confirm that EGS targets the poor. It is also intuitive that casual laborers are more likely to participate because of the nature of EGS work. That literate households are more likely to participate is in line with the fact that being literate can facilitate the process of job application because job seekers need to submit a written application of EGS work (Operational Guidelines 2008). Female headed households are less likely to participate, probably because of the lack of labor. Households playing a leadership role in the village intend to participate, which may be due to two reasons: 1) socially active households are likely to apply for EGS work; 2) taking a leadership role may also favorably influence the allocation of work.

[7] cluster at village level is used.

5. Direct Impact of EGS on participants

Although NREGS can have general equilibrium impacts through price and wage effects, this paper only investigates the direct impacts of EGS. For this purpose, we define our treatment group as the households with at least one member who participated in EGS work. The control group includes the households who live in EGS districts but did not work under EGS.

EGS participation is expected to contribute to higher consumption and asset accumulation of direct beneficiaries through three channels. First, EGS directly transfers financial resources to the participating households and increases household income, which would consequently increase total consumption and nutritional intake. Second, increased income encourages the poor households to save and invest, which could eventually help the poor to be involved in diverse productive activities. Third, most of EGS work takes the form of irrigation and land development and the work sites are often in the participants' own fields. That is, participants may be paid for increasing the productivity of their own land. Increased productivity may lead to higher income and consumption.

From Table 1, we learn that EGS work was clearly lagged behind in Phase 2 & 3 districts. Merely 25% villages have completed any projects by 2007 in the Phase 2 district and only 1% villages have completed a project by 2008 in the Phase 3 district. We therefore expect that income generation through the third mechanism may not materialize by the time of our third round survey (2008) for households in the Phase 2 & Phase 3 districts. Accordingly, we redefine our treatment group as EGS participating households in Phase 1 districts. The control group includes the households who live in Phase 1 districts but did not work under EGS. In this section, we use both difference-in-difference (DID) and triple differences (DDD) to identify the direct impacts of EGS on participants.

5.1 ***Difference-in-Difference Estimation***

To illustrate our approach, let *t*=0,1,2 indicate year 2004, 2006, and 2008, respectively. Let $T_{it} = 1$ if a household *i* is treated at time *t* and $T_{it} = 0$ otherwise. Denote Y_{it}^T as the outcome under treatment, Y_{it}^C as the counterfactual outcome. Then the gain from being treated is $(Y_{i2}^T - Y_{i2}^C)$. We are interested in the average effect of treatment on the treated (ATT), $E(Y_2^T - Y_2^C \mid T_2 = 1)$, which is the expected difference between the actual outcome Y_2^T and the counterfactual outcome Y_2^C for a treated household ($T_2 = 1$). However, the counterfactual outcome Y_2^C is inherently unobservable, which prevents us from estimating the ATT directly. The DID estimates $E(Y_2 - Y_1 \mid T_2 = 1) - E(Y_2 - Y_1 \mid T_2 = 0)$ provides an unbiased estimate of ATT conditional on the parallel trend assumption, $E(Y_2^C - Y_1 \mid T_2 = 1) = E(Y_2 - Y_1 \mid T_2 = 0)$. If we define the selection bias at time *t* as $B_t = E(Y_t^C \mid T_2 = 1) - E(Y_t^C \mid T_2 = 0)$, the parallel trend assumption is equivalent to $B_1 = B_2$, or selection bias being constant in 2006 and 2008. This condition will not hold if household characteristics or initial conditions affect subsequent changes of the outcome variables and have different distributions in the treatment and control groups. Combining the DID approach with propensity score matching (PSM) can address the bias due to observables and time-invariant unobservables but not time-variant unobservables. Having two rounds' data before the intervention allows us to empirically test if the parallel trend assumption holds for 2004 and 2006. The null hypothesis is $E(Y_1 - Y_0 \mid T_2 = 1) = E(Y_1 - Y_0 \mid T_2 = 0)$, or $B_0 = B_1$. The rationale is, if we are confident that the selection bias is constant in 2004 and 2006, we can be confident that the selection bias is also constant in 2008.

Table 5 reports the DID estimation results as well as the results combining DID with PSM

(see the appendix for details on PSM and the implementation), using 2006 and 2008 household data. The dependent variables are in both level and logarithm forms. The logarithm of the dependent variables indicates approximated percentage change of the outcomes. This transformation is more robust to location-specific inflation. However, it also changes the distribution of the outcome and gives poorer households higher weights in terms of the outcomes. The regular DID results suggest a significant positive impact on all of the outcome variables. The DID plus PSM suggests positive however much lower impacts on consumption and nutritional intake. Since the reliability of the estimates depends on the assumption of parallel trend, we use the two rounds pre-intervention data to test the favorability of this assumption. The results presented in Table 6 reject the parallel trend assumption between 2004 and 2006. The regular DID results suggest that the growth of nutritional intakes is lower for EGS participants than non-participants before the program was in place, which holds even after matching and reweighting. The results, however, are not surprising given that self-selection plays an important role in EGS participation. Nevertheless, the results somehow suggest that DID may underestimate the actual program impacts and motivate the application of a triple differences (DDD) approach to be elaborated in the next subsection.

5.2 Triple Differences Estimation

The triple differences (DDD) estimator is to compute

$$DDD = E[(Y_2^T - Y_1) - (Y_1 - Y_0) \mid T_2 = 1] - E[(Y_2 - Y_1) - (Y_1 - Y_0) \mid T_2 = 0],$$

which can be rewritten as $DDD = E[Y_2^T - Y_2^C \mid T = 1] + (B_2 - B_1) - (B_1 - B_0)$. Therefore, the identification assumption of DDD is $B_2 - B_1 = B_1 - B_0$, i.e., the selection bias between period 1

and period 2 is equal to that between period 0 and period 1. Different from the identification assumption of DID, we allow the subsequent change of the counterfactual outcome to differ between the treated and control households. Instead, we assume the difference of the subsequent change over the two periods to be identical between the treated and the control. We argue that this assumption is at least as good as the assumption for DID with parallel trend test passed. To see this point, we note that the assumption for the latter is that $B_0 = B_1$ implies $B_1 = B_2$, which is an sufficient condition while not a necessary condition of the assumption of DDD. In other words, the DDD condition holds if the assumption for DID with parallel trend test passed is satisfied, and the DDD condition may hold even if the assumption of the latter does not hold. To account for the possible remaining bias due the interaction of observables and the difference of the subsequent change over the two periods, we combine DDD with PSM (see the appendix for details on PSM and the implementation.

The DDD results are presented in Table 7. The results are mostly robust across estimation methods for both level and logarithm of the outcomes. The most robust results are on the energy and protein intakes which are positive and significant for both level and logarithm in each method. The estimated magnitude ranges from 162 to 233 Kcal per day per capita for energy intake and 2.7 to 3.4 gram per day per capita for protein intake. According to the results on the logarithm of energy and protein intakes, the estimated impact accounts for 4 to 7 percent and 3 to 5 percent, respectively. Concerning total consumption expenditure per capita, both DDD plus PSM methods detect a positive and significant impact for level and logarithm. The simply DDD points to a significant and larger impact on logarithm though not on the level. The impact is estimated to be 900 to 1000 Rs per year and 9 to 11 percentage points, depending on method. The simply DDD suggests a significant and positive impact on the logarithm but not the level of

non-financial asset. Both DDD & PSM methods point to a significant and positive impact on the level of non-financial asset. Simple DDD and DDD & PSM2 also identify a positive impact on the logarithm of non-financial asset (about 8%).

Overall, we found large, significant impacts of EGS participation on virtually all outcomes across methods. The average total cash transfer to participating households through NREGS is 276 Rs per capita per year. The estimated consumption increase is significantly higher than the amount of direct transfer. This suggests that the participating households have perceived a higher permanent income, which may be due to two reasons. First, the households expect more EGS job opportunities in the future. Second, they may expect higher productivity as improved land quality and irrigation facilities.

6. Conclusions

Exploring a three-year household panel data set, we examine the targeting of NREGS and how NREGS affects some major welfare indicators on its direct beneficiaries. The participation regressions support the notion that that NREGS targets the poor. However, a higher propensity of participation for households playing a leadership role in the village points towards some influence of village leaders in allocation of work. A lower participation propensity for illiterate and female-headed households also suggests that awareness of the program or other constraints on the ability to supply labor continue to be relevant.

The Results from triple differences (DDD) and propensity score matching (PSM) point towards significant and positive impacts of NREGS participation on consumption expenditure, intake of energy and protein, and asset accumulation. In terms of magnitude, the estimated

impact on consumption expenditure exceeds the direct cash transfer from NREGS, suggesting that, on average, the program may have been successful in creating assets that boost returns to local labor and that a significant share of the inflow is saved. We conclude that the short term effects of NREGS on participating households were positive and greater than program cost.

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Appendix

The assumption underlying PS matching is that, conditional on observables, the outcome change if not treated is independent of the actual treatment, i.e., $[(Y_t^0 - Y_{t-1}^0) \perp D \mid X]$. This has been shown to imply $[(Y_t^0 - Y_{t-1}^0) \perp D \mid P(X)]$ where $P(X)$ is the propensity score, defined as $P(X) = \Pr(D = 1 \mid X)$ which, by definition, takes a value between 0 and 1 (Rosenbaum and Rubin 1983). We use a PS-weighted regression method (Hirano *et al.* 2003) which recovers an estimate of the ATT as the parameter β in a weighted least square regression of the form

$$Y_{it} - Y_{i,t-1} = \alpha + \beta D_i + \varepsilon_i, \tag{8}$$

where *i* indexes household, and weights equal one for treated and $\hat{P}(Z)/[1-\hat{P}(Z)]$ for non-treated observations. See (Chen *et al.* 2007, van de Walle and Mu 2007) for empirical applications of this method.

Moreover, to obtain consistent and efficient estimates, we determine the common support region by

$$A_{10} = \left\{ X \mid \hat{P}(X) \le \lambda \right\} \tag{9}$$

where $\lambda = 1$ if

$$\sup_X \frac{1}{1-\hat{P}(X)} \le 2E\left[\frac{1}{1-\hat{P}(X)} \mid D = 1 \right], \tag{10}$$

and λ is a solution to

$$\frac{1}{1-\lambda} = 2E\left[\frac{1}{1-\hat{P}(X)} \mid D=1, \hat{P}(X) \leq \lambda\right] \tag{11}$$

otherwise. It has been shown that under homoskedasticity this trimming method minimizes the variance of the estimated ATT (Crump *et al.* 2007). Our results are based on trimmed PS-weighted DD throughout. We also report the results for the untrimmed simple DD to highlight that trimming and matching will be needed even if mandals were randomly selected.

Table 1: Summary of EGS work completed by year and phase, averaged over villages

		Phase 1		Phase 2		Phase 3
Type of work	2006	2007	2008	2007	2008	2008
Irrigation	0.24	0.60	0.76	0.13	0.46	0.01
Land Improvement	0.18	0.61	0.75	0.15	0.37	0.00
Road	0.04	0.12	0.20	0.00	0.00	0.00
Other	0.17	0.54	0.62	0.00	0.02	0.00
Any project	0.32	0.79	0.88	0.25	0.55	0.01

Table 2: Summary of actual EGS participation by household poverty status

		Phase 1		Phase 2		Phase 3
	2006	2007	2008	2007	2008	2008
If holding a job card						
All households	0.431	0.482	0.494	0.321	0.352	0.372
Poorest of Poor households	0.477	0.521	0.532	0.298	0.338	0.399
Poor households	0.494	0.542	0.557	0.417	0.457	0.462
Not So Poor households	0.358	0.427	0.436	0.262	0.279	0.246
Not Poor households	0.211	0.266	0.275	0.247	0.250	0.108
If participated in EGS work						
All households	0.094	0.149	0.171	0.099	0.112	0.047
Poorest of Poor households	0.088	0.165	0.182	0.102	0.111	0.070
Poor households	0.111	0.171	0.201	0.131	0.139	0.042
Not So Poor households	0.093	0.122	0.141	0.073	0.095	0.024
Not Poor households	0.060	0.073	0.106	0.048	0.071	0.000
Total amount transferred from EGS for participating households (Rs per household)						
All households	2249	2439	2590	2093	2005	936
Poorest of Poor households	2074	2470	2611	2200	1910	788
Poor households	2167	2478	2700	2130	2068	1188
Not So Poor households	2485	2246	2402	1807	2108	1059
Not Poor households	2926	2633	2351	1870	1902	

Table 3: Household outcomes by participation status, over year

	2004		2006		2008	
	Non-Parti	Parti	Non-Parti	Parti	Non-Parti	Parti
Consumption p.c. (Rs/year)	10141	9118	9685	8424	13312	12809
Energy intake p.c. (Kcal/day)	2028	1993	2411	2217	2524	2442
Protein intake p.c. (g/day)	45.37	44.04	49.44	46.16	53.04	51.62
Total non-financial asset p.c. (Rs/year)	4192	3013	4319	3223	6635	5720
Number of households	1610	743	1632	748	1686	755

Table 4: Summary statistics and logit regression of EGS participation, using 2006 data

	Parti		Non-parti		Logit Regression		
	Mean	SD	Mean	SD	Coeff.	SE	Sig.
Household lives in hamlet	0.344	0.475	0.349	0.477	-0.019	0.099	
Household is POP	0.416	0.493	0.384	0.487	0.217	0.129	*
Household is Poor	0.341	0.474	0.273	0.445	0.387	0.130	***
someone's primary occupation is casual labor	0.742	0.438	0.589	0.492	0.509	0.111	***
Household is SC	0.341	0.474	0.235	0.424	0.212	0.116	*
Household is ST	0.083	0.276	0.077	0.266	0.011	0.182	
Household is OC	0.146	0.353	0.238	0.426	-0.011	0.144	
Somebody can write	0.826	0.379	0.760	0.427	0.333	0.131	**
Household size	4.380	1.570	4.051	1.808	0.047	0.032	
Head female	0.074	0.261	0.119	0.324	-0.511	0.171	***
Someone being a leader in village committees or SHGs	0.132	0.338	0.104	0.305	0.290	0.144	**
Consumption p.c. (Rs/year)	8424	3761	9685	4952	0.000	0.000	**
Energy intake p.c. (Kcal/day)	2217	772	2411	855	0.000	0.000	
Protein intake p.c. (g/day)	46.16	15	49.44	17	0.000	0.000	
Total non-financial asset p.c. (Rs/year)	3223	7359	4319	8231	0.006	0.009	
District dummies and constant	Not reported						
Log-likelihood					-1344.50		
Pseudo R^2					0.0534		

Table 5: Difference-in-Difference results using 2006 & 2008 data

Variable	DD	SE		DD+PSM1	SE		DD+PSM2	SE	
Consumption p.c. (Rs/year)	687	276	**	246	58	***	339	58	***
Energy intake p.c. (Kcal/day)	82	22	***	25	30		31	26	
Protein intake p.c. (g/day)	1.58	0.16	***	0.72	0.41	*	0.84	0.28	***
Total non-financial asset p.c. (Rs/year)	45	196		85	336		91	283	
Log of consumption p.c. (Rs/year)	0.089	0.020	***	0.025	0.027		0.046	0.017	***
Log of energy intake p.c. (Kcal/day)	0.021	0.005	***	0.000	0.013		0.007	0.007	
Log of protein intake p.c. (g/day)	0.018	0.003	***	0.001	0.012		0.007	0.006	
Log of total non-financial asset p.c. (Rs/year)	0.153	0.032	***	0.037	0.038		0.087	0.051	*
Number of observations	755	1686		736	1572		736	1572	

Table 6: Test results for the assumption of parallel trend using 2004 & 2006 data

Variable	DD	SE		DD+PSM1	SE		DD+PSM2	SE	
Consumption p.c. (Rs/year)	-204	233		-336	214		-359	220	
Energy intake p.c. (Kcal/day)	-155	43	***	-85	42	**	-98	40	**
Protein intake p.c. (g/day)	-1.83	0.86	**	-0.90	0.87		-1.14	0.85	
Total non-financial asset p.c. (Rs/year)	120	343		-114	299		-114	284	
Log consumption p.c. (Rs/year)	-0.023	0.023		-0.031	0.023		-0.031	0.023	
Log energy intake p.c. (Kcal/day)	-0.052	0.022	**	-0.017	0.023		-0.025	0.022	
Log protein intake p.c. (g/day)	-0.032	0.020		-0.015	0.021		-0.020	0.021	
Log total non-financial asset p.c. (Rs/year)	0.069	0.073		-0.017	0.076		-0.007	0.082	
Number of observations	748	1632		735	1577		735	1577	

Table 7: TD results using 2004, 2006, and 2008 data

Variable	TD	SE		TD+PSM1	SE		TD+PSM2	SE	
Consumption p.c. (Rs/year)	971	635		914	286	***	967	309	***
Energy intake p.c. (Kcal/day)	233	23	***	162	9	***	173	13	***
Protein intake p.c. (g/day)	3.36	0.50	***	2.66	0.28	***	2.85	0.25	***
Total non-financial asset p.c. (Rs/year)	-15	380		350	80	***	348	92	***
Log of consumption p.c. (Rs/year)	0.112	0.047	**	0.087	0.029	***	0.093	0.025	***
Log of energy intake p.c. (Kcal/day)	0.072	0.032	**	0.035	0.021	*	0.044	0.016	***
Log of protein intake p.c. (g/day)	0.048	0.021	**	0.031	0.015	**	0.036	0.012	***
Log of total non-financial asset p.c. (Rs/year)	0.081	0.044	*	0.056	0.063		0.075	0.045	*
Number of observations	755	1686		736	1572		736	1572	