ASARC Working Paper 2008/04
Revised May 08

National Rural Employment Guarantee Programme in Andhra Pradesh: Some Recent Evidence*

Raghbendra Jha,
Australian National University

Raghav Gaiha
University of Delhi,

Shylashri Shankar
Centre for Policy Research

* We are grateful to Raj Bhatia for his competent computations and to ARC-AusAID Linkage grant LP0775444 for financial support.

1. Introduction

This is a sequel to an earlier analysis of the NREGA in Rajasthan (Jha et al. 2008). Here we focus on the performance of this scheme in selected villages in Andhra Pradesh during 2007. Although Andhra Pradesh is not among the best in the CAG report (CAG, 2007), our analysis points to a more favourable assessment. Also, our assessment suggests that Andhra Pradesh was in some respects a better performer than Rajasthan (among the top performers in the CAG performance audit)[1]. The objective of the present analysis is, however, limited to some indicators of performance. We found that AP performed better than Rajasthan in terms of targeting poorer caste and income groups such as SC, ST and landless households. The two states also demonstrated some similarities in the duration of workdays and general implementation of the scheme, thus contradicting some of the CAG findings.

The present analysis is part of a larger project designed to assess the cost-effectiveness of social safety nets in three Indian states viz. Rajasthan, Andhra Pradesh and Maharashtra. The results given below are based on a pilot survey of three villages in Chittoor district, Andhra Pradesh. These villages (Kaligiri, Obulayyapale and Reddivaripalle) were covered with sampling fractions varying from ½ to 1/5 of all households,[2] epending on the size of population Total number of households interviewed in December, 2007, was 602. Here the focus is on participation in NREG of different socio-economic groups and duration of their participation[3].

Workfare

Since workfare is an important feature of poverty alleviation, it warrants a critical review. In doing so, the incentive aspects are examined below[4].

[1] A recent survey of the NREG by PRIA in 14 states shows that a mere 6 per cent of the households secured 100 days of employment in a year (*Outlook*, 2007). For a more comprehensive assessment of earlier reviews, see Jha et al. (2008).

[2] Total number of households in Kaligiri was 328 out of which 199 were interviewed; the corresponding numbers for Obulayyapale were 476 and 202, respectively; and in Reddivaripalle the total was 1012 and 201 were interviewed.

[3] The field-work and data processing were carried out by Raj Bhatia in consultation with the authors.

[4] Workfare underpinned the 1834 Poor Law in England. The idea was that the conditions of the able-bodied pauper be the 'less-eligible'-desirable, agreeable, favourable-than that of the 'lowest class' of labourer" Himmelfarb, 1984, p.163). Further "It is only ….by making relief in all cases less agreeable than wages, that anything deserving the name of improvement can be hoped for" (Himmelfarb, 1984, p.165).

The incentive case for workfare in poverty alleviation rests on two arguments. One is the screening argument, i.e. a work-requirement tends to exclude the non-poor (or, more generally, the relatively affluent). The other is the deterrent argument, i.e. the work-requirement does not deter poverty-reducing investments (say, in human capital). These are considered in turn below.

The screening argument is motivated by administrative difficulties in identifying the poor. Abilities are not directly observable. Although earnings could yield some clues, their estimates tend to be patchy and unreliable. Given these difficulties, self-selection mechanisms such as work-requirement are appealing. Under certain conditions, it can be shown that work-requirement is a cost-minimizing poverty alleviation strategy (as compared with uniform transfers). Assuming that the poor work, the work-requirement will reduce their earnings from elsewhere and therefore necessitate larger transfers to get them out of poverty. This is the cost of self-selection through work-requirement; but there is also a cost reduction on account of lower transfers to the non-poor (as their incentive to masquerade as poor is weakened). There is a particular work-requirement which resolves this trade-off optimally, provided that the poor are a small fraction of the population and their earning potential is limited.

The deterrent argument takes a different form. Transfers reduce the returns to effort and thus induce individuals to choose a lower level of effort. This increases the number of poor, as also the cost of poverty alleviation. Under certain conditions, however, workfare is optimal. There is a particular work-requirement which induces income-enhancing choices, provided that the share of the poor in the population is small, and their earning potential is low[5].

Methodology

First**,** a set of cross-tabulations are given to identify the correlates of participation in NREGA. As these tabulations contain averages, two econometric exercises are carried out to assess their relative importance. These involve a probit analysis of participation in NREG and a tobit analysis of duration of participation.

[5] This summarises the exposition in Besley and Coate (1992), and for a review of workfare in India, see (Gaiha, 2000).

Suppose that a household participates in this scheme (denoted as y=1, and 0 otherwise). It is hypothesised that a set of household –specific characteristics such as caste/ethnic affiliation- whether a member of SC, ST or "Others"- educational attainment, land owned, number of male and female adults in the household, occupational status, gathered in a vector, *X*, explain the household's participation status (whether participating in NREG or not), so that

$$\text{Prob}\,(y=1 \mid X) = F\,(\beta' X)$$

$$\text{and} \quad \text{Prob}\,(y=0 \mid X) = 1 - F\,(\beta' X) \qquad (1)$$

The set of parameters, β, reflects the impact of changes in *X* on the probability of being poor.

Assuming the normal distribution, a probit specification is obtained.

$$\text{Prob}\,(y=1 \mid X) = \int_{\infty}^{\beta' X} \phi(t)\,dt$$

$$= \Phi(\beta' X) \qquad (2)$$

where the function $\Phi(.)$ denotes the standard normal distribution.

The probability model is a regression

$$E\left[y \mid X\right] = 0\,\left[1\text{-}F\,(\beta' X)\right] + 1\,\left[F(\beta' X)\right]$$

$$= F(\beta' X) \qquad (3)$$

where $F(\beta' X) = \Phi(\beta' X)$

This model is estimated using Maximum Likelihood.[6]

The marginal effects are computed as

$$\frac{\partial E\left[y \mid X\right]}{\partial X} = \phi(\beta' X)\beta \qquad (4)$$

where ϕ (t) is the standard normal density.

A common non-parametric test to examine whether all the slopes in the regression are zero, is the likelihood ratio test. This likelihood ratio statistic is

$$LR = -2\left[\ln \hat{L}_R - \ln \hat{L}_U\right], \qquad (5)$$

where $\ln \hat{L}_R$ and $\ln \hat{L}_U$ are the log-likelihood functions evaluated using the restricted and unrestricted estimates, respectively. This follows a χ^2 distribution with degrees of freedom equal to the number of restrictions being tested.[7]

[6] For details, see Greene (1993).

Saving the probabilities of participation obtained from the probit and combining them with household characteristics, a tobit model is used to analyse the duration of participation in NREG. Algebraically, a general specification is in terms of an index function (d*),

$$d^*_i = X_i'\beta + \varepsilon_i$$
$$d_i = 0 \text{ if } d^*_i \le 0, \qquad (6)$$
$$d_i = d^*_i \text{ if } d^*_i > 0 \text{.....(6)}$$

where *d* (denoting days worked in NREG) takes a value >0 for the participants and 0 for non-participants, and *X* is a vector of household characteristics[8]. For our purpose, since d^*_i is unobserved, and d_i is, the following result is useful:

$$\frac{\partial E[d_i | X_i]}{\partial X_i} = \beta \Phi\left(\frac{\beta' X_i}{\sigma}\right) \qquad (7)$$

The tobit model is estimated using Maximum Likelihood.

Results

We present our results in two broad categories. First, in our cross tabulations we report on statistics on participation in the NREG Second, we model the participation of workers in the NREG. We report our results under these headings.

(a) Cross-Tabulations

Over 50 per cent of the households participated in the NREGA in the sample villages. Among the participants, about half were Others, about one third were SCs and about 13 per cent were STs. As the SCs and STs are traditionally disadvantaged groups, it is striking that about 56 per cent of the SCs and about 75 per cent of the STs participated in this scheme.

[7] For details, see Greene (1993).
[8] Alternatively, we could have used Heckman's sample selection model. As the results tend to be very sensitive to the specification used, we have used a different procedure. For details, see Greene (1993).

Table 1
Participation in NREGA by Social Group

nreg	caste OT	SC	ST	Total
N	201	78	14	293
	68.60	26.62	4.78	100.00
	54.32	44.07	25.45	48.67
	33.39	12.96	2.33	48.67
Y	169	99	41	309
	54.69	32.04	13.27	100.00
	45.68	55.93	74.55	51.33
	28.07	16.45	6.81	51.33
Total	370	177	55	602
	61.46	29.40	9.14	100.00
	100.00	100.00	100.00	100.00
	61.46	29.40	9.14	100.00

Key
frequency
row percentage
column percentage
cell percentage

Table 2
Participation in NREGA by Occupation

nreg	AL	OL	OT	SA	SN	Total
N	135	20	34	95	9	293
	46.08	6.83	11.60	32.42	3.07	100.00
	37.29	100.00	69.39	59.38	81.82	48.67
	22.43	3.32	5.65	15.78	1.50	48.67
Y	227	0	15	65	2	309
	73.46	0.00	4.85	21.04	0.65	100.00
	62.71	0.00	30.61	40.63	18.18	51.33
	37.71	0.00	2.49	10.80	0.33	51.33
Total	362	20	49	160	11	602
	60.13	3.32	8.14	26.58	1.83	100.00
	100.00	100.00	100.00	100.00	100.00	100.00
	60.13	3.32	8.14	26.58	1.83	100.00

In the next cross-classification, we focus on the distribution of NREGA participants by occupation (of head of household). Among the participants, nearly three fourths were agricultural labour households, and over one fifth belonged to self-employed in agriculture. The latter is not so surprising as it comprises a large number of households cultivating small amounts of land that barely allow them to subsist. Looking at the column percentages, we find that about 63 per cent of agricultural labour households participated and over a quarter of the self-employed in agriculture. It is somewhat surprising that none among the other labour households participated.

Table 3
Participation in NREGA by Landowned

	RECODE of land_ha					
nreg	0-0.1ha	0.1-0.75h	0.75-1.5h	1.5-2.5ha	>2.5ha	Total
N	120	70	70	25	8	293
	40.96	23.89	23.89	8.53	2.73	100.00
	43.80	46.05	51.47	83.33	80.00	48.67
	19.93	11.63	11.63	4.15	1.33	48.67
Y	154	82	66	5	2	309
	49.84	26.54	21.36	1.62	0.65	100.00
	56.20	53.95	48.53	16.67	20.00	51.33
	25.58	13.62	10.96	0.83	0.33	51.33
Total	274	152	136	30	10	602
	45.51	25.25	22.59	4.98	1.66	100.00
	100.00	100.00	100.00	100.00	100.00	100.00
	45.51	25.25	22.59	4.98	1.66	100.00

Table 3 further corroborates the pro-poor targeting of the NREGA. The landless or nearly landless households (<. 75 ha) accounted for a large majority of participants (over 76 per cent). In each of the three lowest landowned groups, the proportions of participants were high ranging from about 50 per cent to more. This suggests that the NREGA served as an important supplementary source of income.

Table 4
Participation in NREGA by Household Size

	RECODE of hhsize			
nreg	1-3	4-5	>5	Total
N	137	120	36	293
	46.76	40.96	12.29	100.00
	53.31	43.96	50.00	48.67
	22.76	19.93	5.98	48.67
Y	120	153	36	309
	38.83	49.51	11.65	100.00
	46.69	56.04	50.00	51.33
	19.93	25.42	5.98	51.33
Total	257	273	72	602
	42.69	45.35	11.96	100.00
	100.00	100.00	100.00	100.00
	42.69	45.35	11.96	100.00

In Table 4, we examine whether participation in NREGA is also linked to household size. A presumption is that the larger the household size, the greater may be the flexibility among adult members to join this scheme. This is corroborated here, as the proportion of households comprising 4-5 members is higher than that of smaller households. An issue then is why the share of participants in the largest household size group (>5) is lower. To the extent that household size and landowned are correlated, many are likely to be relatively affluent and thus unlikely to participate.

Table 5
Duration of Participation in NREGA (Days)

	RECODE of n_days			
nreg	0 days	1-50days	51-90days	>90days	Total
N	293	0	0	0	293
	100.00	0.00	0.00	0.00	100.00
	100.00	0.00	0.00	0.00	48.67
	48.67	0.00	0.00	0.00	48.67
Y	0	179	87	43	309
	0.00	57.93	28.16	13.92	100.00
	0.00	100.00	100.00	100.00	51.33
	0.00	29.73	14.45	7.14	51.33
Total	293	179	87	43	602
	48.67	29.73	14.45	7.14	100.00
	100.00	100.00	100.00	100.00	100.00
	48.67	29.73	14.45	7.14	100.00

Contrary to recent assessments (e.g., CAG, 2007), the shares of households that participated for long spells are moderately high.

About 28 percent worked for 51-90 days while about 14 percent worked for more than 90 days. Besides, the average number of days worked in each column was high-29 in the range 1-50 days, 67 in the next higher range and about 100 days in the highest[9].

Table 6
Duration of Participation in NREGA by Social Group

	RECODE of n_days			
caste	0 days	1-50days	51-90days	>90days	Total
OT	201	97	41	31	370
	54.32	26.22	11.08	8.38	100.00
	68.60	54.19	47.13	72.09	61.46
	33.39	16.11	6.81	5.15	61.46
SC	78	54	39	6	177
	44.07	30.51	22.03	3.39	100.00
	26.62	30.17	44.83	13.95	29.40
	12.96	8.97	6.48	1.00	29.40
ST	14	28	7	6	55
	25.45	50.91	12.73	10.91	100.00
	4.78	15.64	8.05	13.95	9.14
	2.33	4.65	1.16	1.00	9.14
Total	293	179	87	43	602
	48.67	29.73	14.45	7.14	100.00
	100.00	100.00	100.00	100.00	100.00
	48.67	29.73	14.45	7.14	100.00

[9] Details will be furnished on request.

Disaggregation of duration of participation by social group corroborates our earlier finding of pro-poor targeting of NREGA. Among the two disadvantaged groups, the participants had long spells of work. About a quarter of the SC households worked for 50 days or more while among the STs the corresponding share was a little under a quarter. Also, the average number of days worked were high. Among the SCs, these were 31 days, 64 days and 100 days for the three ranges of days worked. Among the SCs, the averages were similar-33 days, 64 days and 100 days. The average for Others, however, was slightly higher in the range 51-90 days (about 70 days).

Table 7
Duration of Participation in NREGA by Occupation

	RECODE of n_days			
ocp	0 days	1-50days	51-90days	>90days	Total
AL	135	131	65	31	362
	37.29	36.19	17.96	8.56	100.00
	46.08	73.18	74.71	72.09	60.13
	22.43	21.76	10.80	5.15	60.13
OL	20	0	0	0	20
	100.00	0.00	0.00	0.00	100.00
	6.83	0.00	0.00	0.00	3.32
	3.32	0.00	0.00	0.00	3.32
OT	34	11	4	0	49
	69.39	22.45	8.16	0.00	100.00
	11.60	6.15	4.60	0.00	8.14
	5.65	1.83	0.66	0.00	8.14
SA	95	36	17	12	160
	59.38	22.50	10.63	7.50	100.00
	32.42	20.11	19.54	27.91	26.58
	15.78	5.98	2.82	1.99	26.58
SN	9	1	1	0	11
	81.82	9.09	9.09	0.00	100.00
	3.07	0.56	1.15	0.00	1.83
	1.50	0.17	0.17	0.00	1.83
Total	293	179	87	43	602
	48.67	29.73	14.45	7.14	100.00
	100.00	100.00	100.00	100.00	100.00
	48.67	29.73	14.45	7.14	100.00

Among agricultural labour households-typically the most poverty prone in rural areas-more than a quarter worked for more than 50 days. Also, among the self-employed in agriculture, about 18 per cent of the households worked for 50 days or more. Their averages were high too. Among the former, the average in the range 51-90 days was 66 days, and 99 in the highest range. Among the self-employed in agriculture, the corresponding values were 70 days and 99 days. By contrast, there were none among Others in the highest range of days worked.

Table 8
Duration of Participation in NREGA by Landowned

RECODE of land_ha	RECODE of n_days 0 days	1-50days	51-90days	>90days	Total
0-0.1ha	120	88	43	23	274
	43.80	32.12	15.69	8.39	100.00
	40.96	49.16	49.43	53.49	45.51
	19.93	14.62	7.14	3.82	45.51
0.1-0.75ha	70	49	23	10	152
	46.05	32.24	15.13	6.58	100.00
	23.89	27.37	26.44	23.26	25.25
	11.63	8.14	3.82	1.66	25.25
0.75-1.5ha	70	37	19	10	136
	51.47	27.21	13.97	7.35	100.00
	23.89	20.67	21.84	23.26	22.59
	11.63	6.15	3.16	1.66	22.59
1.5-2.5ha	25	4	1	0	30
	83.33	13.33	3.33	0.00	100.00
	8.53	2.23	1.15	0.00	4.98
	4.15	0.66	0.17	0.00	4.98
>2.5ha	8	1	1	0	10
	80.00	10.00	10.00	0.00	100.00
	2.73	0.56	1.15	0.00	1.66
	1.33	0.17	0.17	0.00	1.66
Total	293	179	87	43	602
	48.67	29.73	14.45	7.14	100.00
	100.00	100.00	100.00	100.00	100.00
	48.67	29.73	14.45	7.14	100.00

Table 8 unravels a picture similar to the preceding with long spells of participation among the landless and near-landless. In each of the three lowest landowned groups, a quarter or slightly lower share participated for 50 days or more. The averages were high- the landless on average worked 66 days in the range 51-90 days and 100 days in the highest range, while the next higher group of nearly landless worked for 65 and 98 days, respectively. By contrast, among those in the highest range of landowned (i.e. >2.5 ha) none worked for more than 90 days and the average for the range 51-90 days was markedly lower (53 days).

Graphical illustrations of these findings are given in Fig: 1–4.

Fig: 1 Participation in NREGA by Social Group

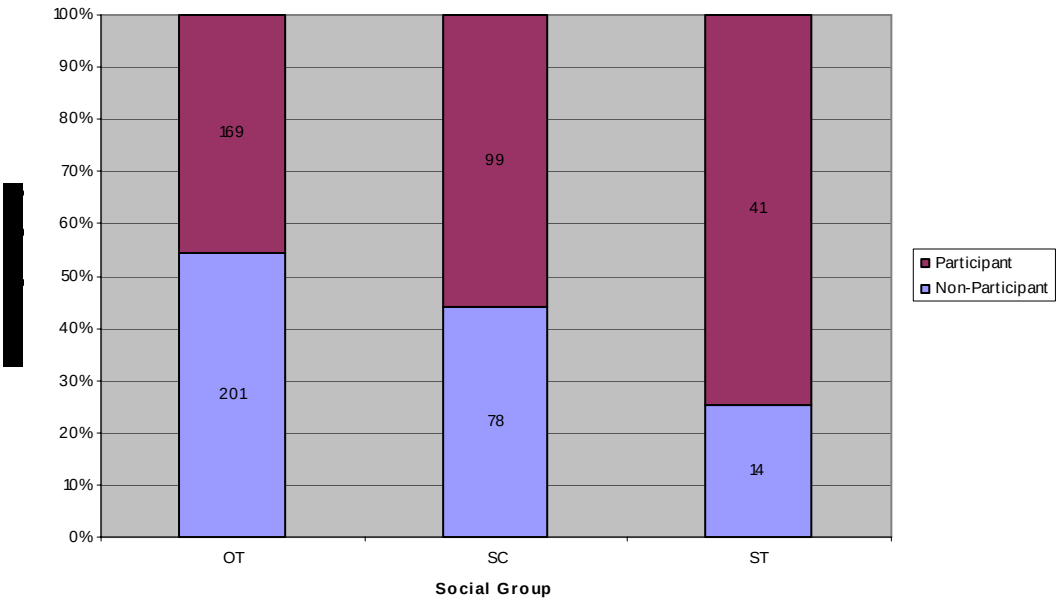


Fig: 2 Average Number of Days of Participation by Social Group

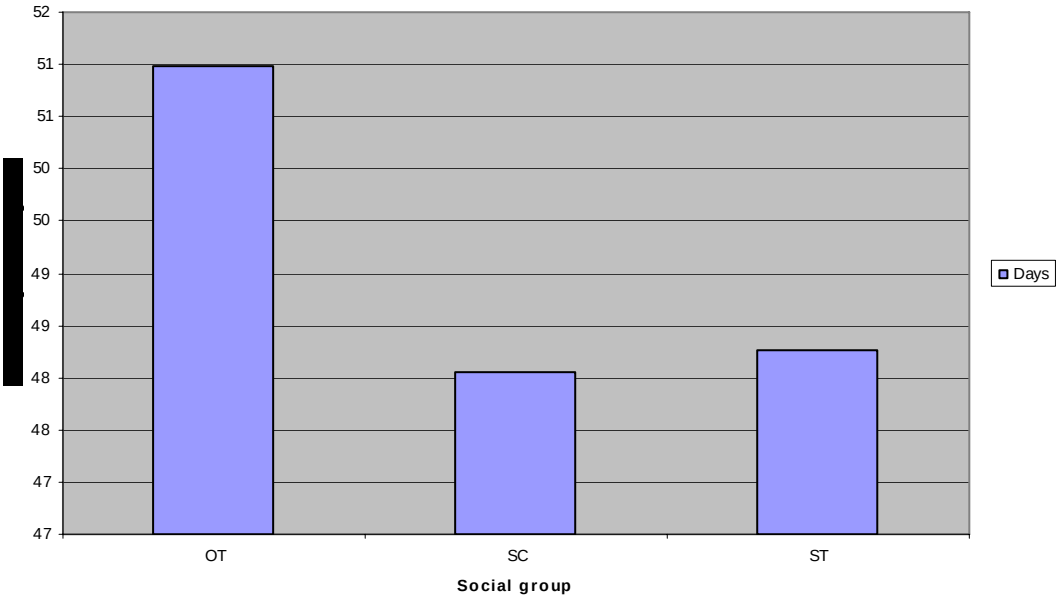


Fig: 3: Average Number of Days by Occupation

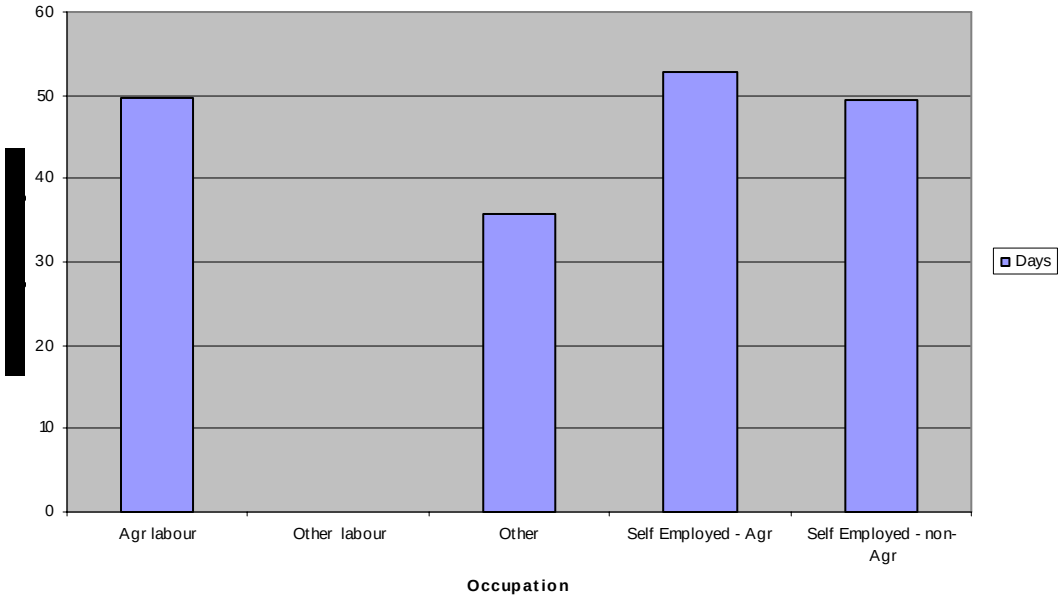
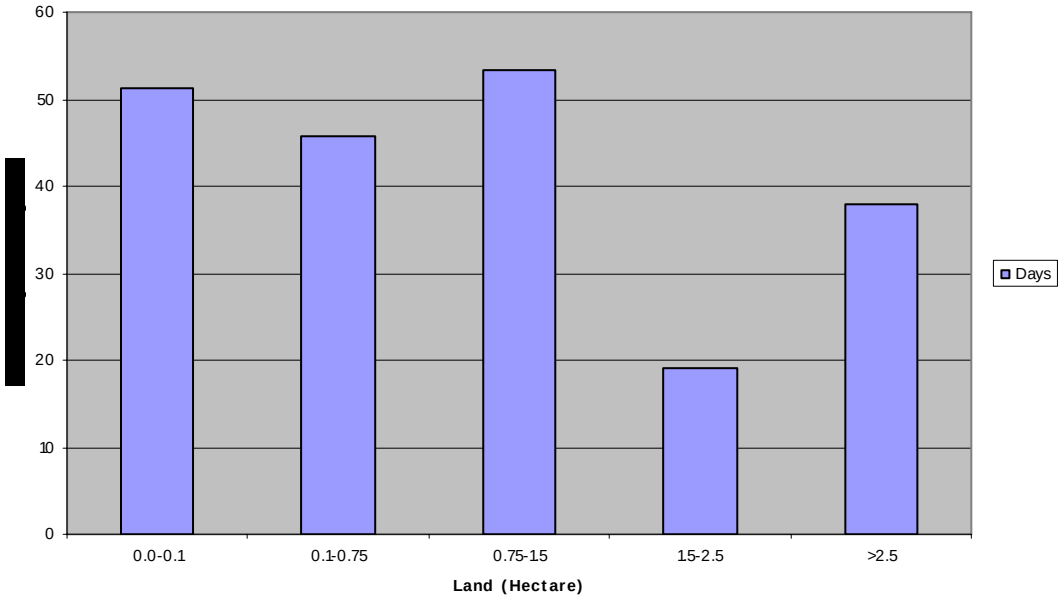


Fig: 4 Average Number of Days by Landowned



(b) Determinants of Participation in NREGA

Tables 9-11 contain probit results on participation in the NREGA using three different occupations primarily to avoid the social group, landownership and occupational overlaps. So instead of commenting on each of these tables, we will confine our remarks to a selection of the results. Let us first make a general remark about the validity of these specifications.

Each is valid using the log-likelihood ratio test. However, the results based on landownership and occupation are more interesting.

Table 9
Determinants of Participation in NREGA (1)

```
Probit regression                                 Number of obs   =        602
                                                  LR chi2(7)      =     129.21
                                                  Prob > chi2     =     0.0000
Log likelihood = -352.45775                       Pseudo R2       =     0.1549

------------------------------------------------------------------------------
 participant |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 _Icaste_r_2 |   .0164953   .1287037     0.13   0.898    -.2357592    .2687499
 _Icaste_r_3 |   .1327048   .2093987     0.63   0.526    -.2777092    .5431187
         a_m |  -.1149364   .0809183    -1.42   0.155    -.2735333    .0436606
         a_f |  -.0025173   .0917896    -0.03   0.978    -.1824215    .1773869
      hhsize |   .1319535   .0536505     2.46   0.014     .0268005    .2371064
 _Ivillage_2 |   1.314918   .1464209     8.98   0.000     1.027938    1.601898
 _Ivillage_3 |   .0973659   .1316857     0.74   0.460    -.1607333    .3554652
       _cons |  -.7519259   .1824375    -4.12   0.000    -1.109497    -.394355
```

Table 10
Determinants of Participation in NREGA (2)

```
Probit regression                                 Number of obs   =        582
                                                  LR chi2(8)      =     128.85
                                                  Prob > chi2     =     0.0000
Log likelihood = -337.87342                       Pseudo R2       =     0.1601

------------------------------------------------------------------------------
 participant |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
_Ioccupati~1 |    .619115   .2141496     2.89   0.004     .1993896     1.03884
_Ioccupati~4 |   .4413933    .224657     1.96   0.049     .0010736    .8817129
_Ioccupati~5 |   -.138111   .4869044    -0.28   0.777    -1.092426    .8162041
         a_m |  -.1144858   .0837604    -1.37   0.172    -.2786531    .0496816
         a_f |  -.0049264   .0945665    -0.05   0.958    -.1902734    .1804206
      hhsize |   .1437826   .0548362     2.62   0.009     .0363057    .2512594
 _Ivillage_2 |   1.184155   .1460751     8.11   0.000      .897853    1.470457
 _Ivillage_3 |   .0767737   .1373493     0.56   0.576    -.1924261    .3459735
       _cons |  -1.197632   .2712979    -4.41   0.000    -1.729366   -.6658983
```

Table 10 contains the results using the occupational classification. Both agricultural labour and self-employed in agriculture possess significant positive coefficients implying higher probabilities of participation relative to the default category (Others). Household size has a significant positive coefficient too, implying larger households have higher probabilities of participation in NREGA. Controlling for the effects of these variables, the dummy for the second village (Obulayyapale) has a significant positive coefficient, implying higher probability of participation in this village relative to the first (Kaligiri). Whether this is because of generally low living standards (relative to the default case) or due to lower agricultural wage rates cannot be ascertained from the data at hand.

Table 11
Determinants of Participation in NREGA (3)

```
Probit regression                                 Number of obs   =        602
                                                  LR chi2(9)      =     150.58
                                                  Prob > chi2     =     0.0000
Log likelihood = -341.76977                       Pseudo R2       =     0.1805

------------------------------------------------------------------------------
 participant |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  _Iland_g_2 |  -.0343466     .13775    -0.25   0.803    -.3043317    .2356384
  _Iland_g_3 |  -.0168609   .1453261    -0.12   0.908    -.3016949    .2679731
  _Iland_g_4 |  -1.145343    .313387    -3.65   0.000     -1.75957   -.5311155
  _Iland_g_5 |  -1.298235   .5472789    -2.37   0.018    -2.370882   -.2255885
         a_m |  -.0838243   .0827267    -1.01   0.311    -.2459656     .078317
         a_f |   .0437135   .0941933     0.46   0.643     -.140902    .2283289
      hhsize |     .13628   .0545694     2.50   0.013      .029326     .243234
 _Ivillage_2 |   1.385593   .1419456     9.76   0.000     1.107384    1.663801
 _Ivillage_3 |   .1900725   .1332163     1.43   0.154    -.0710267    .4511716
       _cons |  -.8429995   .1866192    -4.52   0.000    -1.208766   -.4772326
```

Similar results are obtained by substituting landowned groups for occupations in Table 11. Those in the two highest landowned groups exhibit significantly lower probabilities of participation in NREGA than the landless, further corroborating pro-poor targeting. Household size and the second village dummy have effects on participation similar to those given in the previous specification.

Since the probit coefficients are not directly comparable, the marginal effects (for one specification) are given in Table 12. The landownership effects are large, as also that of the village dummy. The effect of household size is, however, relatively small (but significant).

Table 12
Determinants of Participation in NREGA (Marginal Effects)

```
Probit regression, reporting marginal effects           Number of obs =    602
                                                        LR chi2(9)    = 150.58
                                                        Prob > chi2   = 0.0000
Log likelihood = -341.76977                             Pseudo R2     = 0.1805

------------------------------------------------------------------------------
partic~t |      dF/dx   Std. Err.      z    P>|z|     x-bar  [    95% C.I.   ]
---------+--------------------------------------------------------------------
_Iland~2*|  -.0136899   .0549184    -0.25   0.803   .252492  -.121328  .093948
_Iland~3*|  -.0067195   .0579272    -0.12   0.908   .225914  -.120255  .106816
_Iland~4*|  -.3930559   .0753457    -3.65   0.000   .049834  -.540731 -.245381
_Iland~5*|  -.4185439   .1048331    -2.37   0.018   .016611  -.624013 -.213075
     a_m |  -.0333993   .0329637    -1.01   0.311   1.53156  -.098007  .031208
     a_f |   .0174174   .0375318     0.46   0.643   1.49169  -.056144  .090978
  hhsize |      .0543   .0217448     2.50   0.013   3.80731   .011681  .096919
_Ivill~2*|   .4950505   .0408889     9.76   0.000   .335548    .41491  .575191
_Ivill~3*|   .0754635   .0525977     1.43   0.154   .333887  -.027626  .178553
---------+--------------------------------------------------------------------
  obs. P |    .513289
 pred. P |    .519922  (at x-bar)
```

(*) dF/dx is for discrete change of dummy variable from 0 to 1
    z and P>|z| correspond to the test of the underlying coefficient being 0

(c) Duration of Participation in NREGA

As stated earlier, duration is conditional upon participation in NREGA. Using the probabilities of participation from the landowned probit in Table 11 and some exogenous variables in a tobit regression, we have reported three sets of results on duration of participation in this scheme in Tables 13-15. We shall confine our comments to Tables 14 and 15, as these are more interesting.

The first important result is that the higher the probability of participation, the longer is the duration of participation. As we have already shown that large subsets of poor and disadvantaged households exhibit higher probabilities of participation, the pro-poor targeting is reinforced by the finding that they are also likely to participate longer. Equally interesting is the result that the second village dummy has a significant negative coefficient (recall that in the probit the coefficient was consistently positive), implying lower duration of participation, controlling for the effects of all other variables. The occupational tobit results suggest that in addition to these two effects occupation has a significant effect. Specifically, both occupations 1 and 4 (agricultural labour and self-employed in agriculture) have significant positive effects on duration of participation relative to the omitted group (Others). These results imply that households belonging to these occupations are likely to work longer than Others (the omitted occupation).

Comparative Analysis of Targeting in Rajasthan and Andhra Pradesh

In terms of some indicators, Andhra Pradesh did better than Rajasthan, while on others, both performed satisfactorily. Firstly, in terms of pro-poor targeting by the scheme, AP performed better than Rajasthan (a finding that is contrary to the CAG report). One third of our sample participated in NREG in Rajasthan as compared with over half of the households in AP. Of these participants, 90% belonged to the "Others" category in Rajasthan and only 10% (SC and ST) constituted some of the actual targets of the scheme. In AP, in contrast, about a third were SCs and 13 percent were STs – a finding that demonstrates greater accuracy of targeting.

Secondly, the better targeting of the NREGA in Andhra Pradesh is reflected in the fact that 75% of participants were agricultural labourers, and a fifth were self-employed in agriculture, and none belonged to the "other labour" category. Compare these figures with Rajasthan where 46% of participants were self-employed in agriculture and 40% were employed in

"other labour". That NREGA was better targeted among the landless and those owning small amounts in AP is illustrated in Fig: 5. What is further illustrated is that whatever the range of near landlessness, the fact that the CDF for AP lies above that for Rajasthan implies better targeting in the former. As the incidence of landlessness –including near landlessness- was also higher in AP, it follows that the scheme in question served their interests better. These are illustrated below in Fig: 6 &7.

Fig: 5 Cumulative Distribution by Landowned

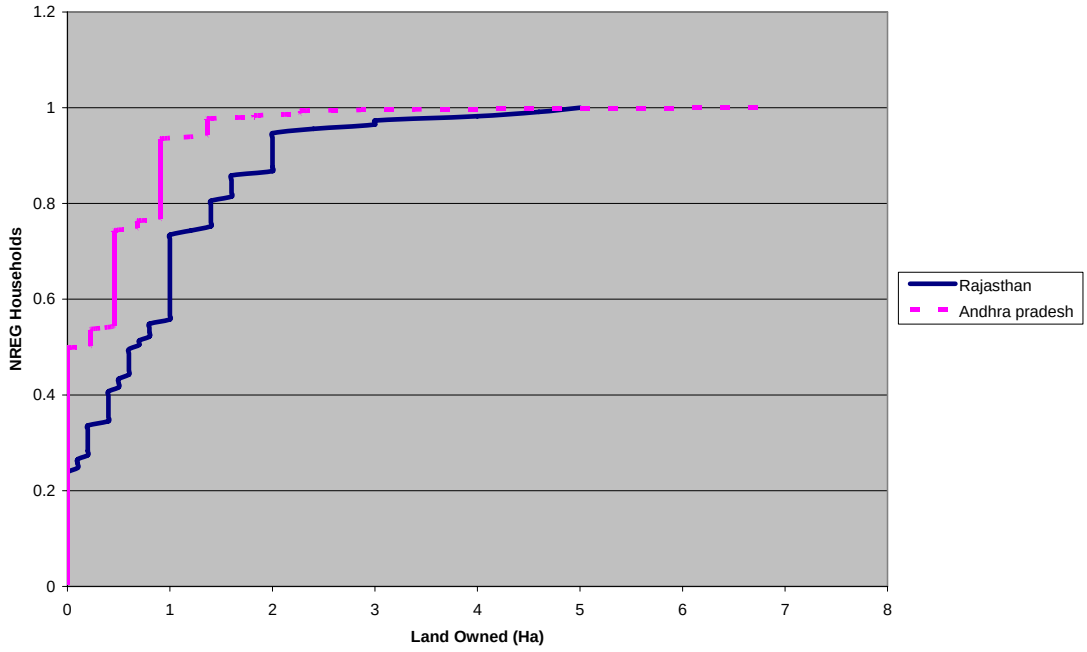


Fig: 6 Cumulative Distribution Function of All Households by Landowned in Rajasthan and Andhra Pradesh

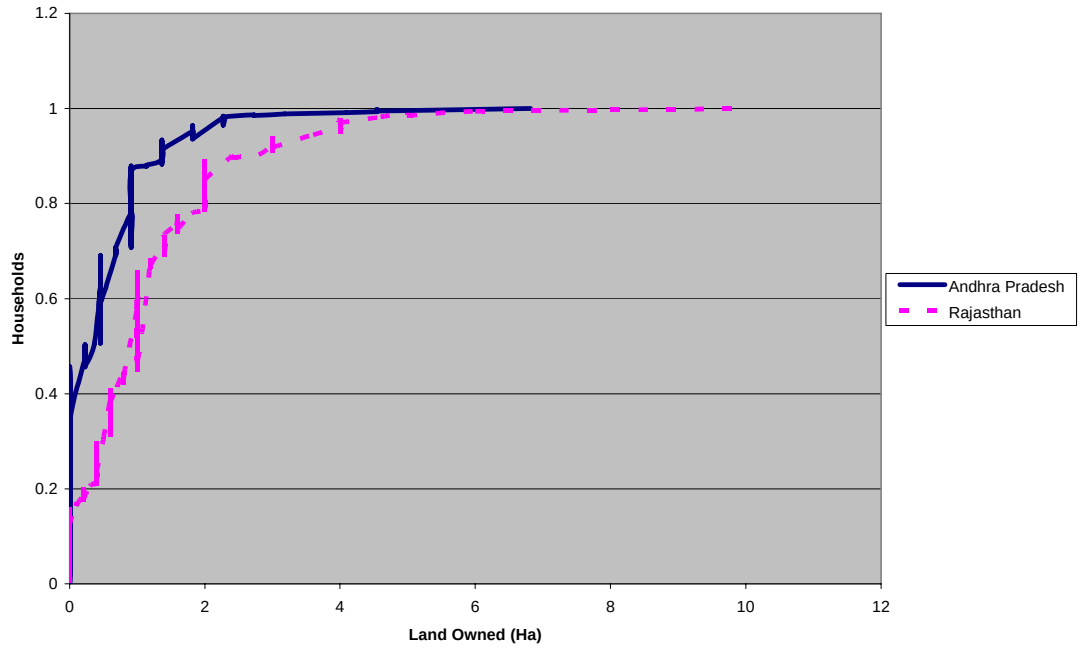
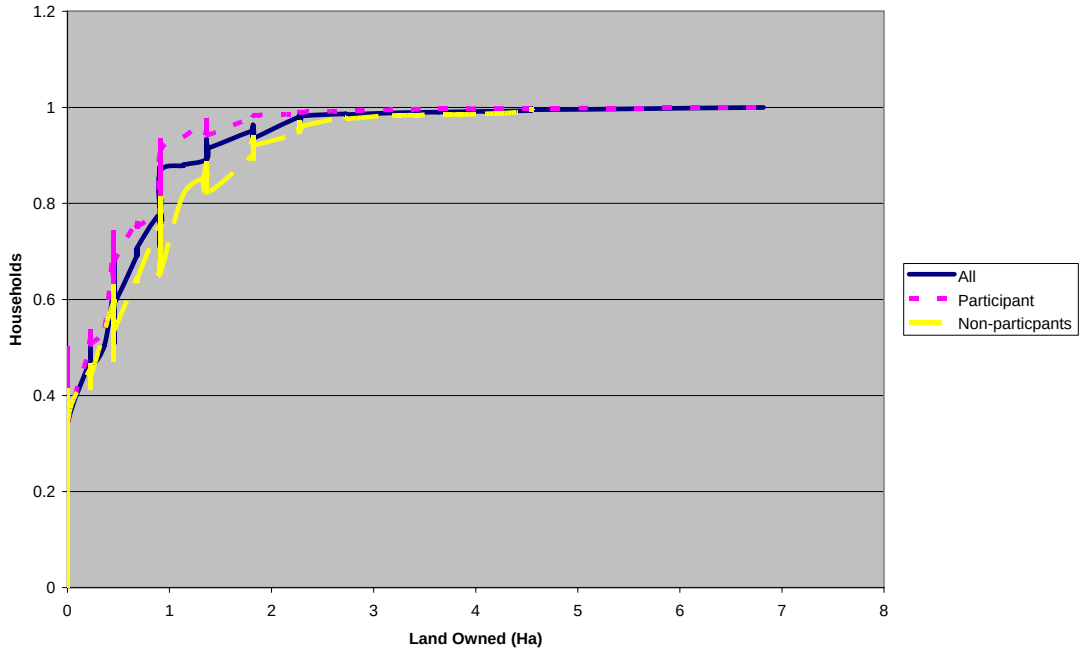


Fig:7 Andhra Pradesh-Cumulative Distribution of Households by Landowned



Besides, the probit results (Table 11) showing the lower likelihood of participation by the two highest landowning groups as compared with the landless, further confirm the superior targeting of the scheme in AP. Contrast this with the figures in Rajasthan where all land owning groups (except the highest land owned group) were significantly more likely than the landless to participate in the scheme.[10]

There were, however, some similarities in the implementation of the NREGA in the two states. In both states, the proportion of the landless or nearly landless (<.75 ha.) comprised the majority of participants in the scheme, suggesting that the programme was a supplementary source of income to these groups. In both states, the NREG seems to have been well targeted by asset class – none of those with over 2.5 ha land worked for more than 90 days in AP and the average for the 51-90 days was relatively low (53 days). Similarly, in Rajasthan, the participants from this group worked for less than 50 days, demonstrating that perhaps concerns about the capture of NREGA by the landed elites may not be as grave.

Thirdly, data from the pilots in both states suggests that the CAG may have under-reported the duration of participation in the scheme. Contrary to the findings of the CAG report, about 60% of the participating households in Rajasthan worked for over 50 days (20% worked for

[10] See table 15 in Jha et.al (2008)

over 90 days).[11] The draft CAG audit report noted that in Rajasthan, "10.94 lakh households (73 per cent of registered households) demanded employment, and 100 days of employment was provided to only 2.39 lakh households. Thus, the claim of the State Government of generation of 999 lakh mandays at an average of 91 days per household demanding employment appears unrealistic."[12] Andhra Pradesh too belies the CAG assessment: about 42 percent worked for over 50 days (14% for over 90 days). In both states, however, compared to participation by more privileged groups, the two most disadvantaged groups, the SC and ST benefited less (i.e. a majority worked for less than fifty days), and SC households worked more days than ST households.

The tobit results on the determinants of the duration of participation are also similar: the greater the probability of participation, the longer is the duration of participation in NREG. As the probability of participation of low-income or disadvantaged social groups is high, it follows that in both states these groups also tend to participate longer.

Perhaps the safeguards implemented by Andhra Pradesh could account for that state's better performance in terms of participation. In a recent comment, Dreze et al. (2008) noted that "Andhra Pradesh has put in place a system of institutionalised social audits, involving routine verification of NREGA records through participatory processes. Judging from our brief visit, and from the social audit reports, these safeguards are quite effective. While various forms of petty corruption (such as bribes being taken by postmasters) have emerged from the social audits, there is no evidence of the sort of large-scale fraud that plagued public works schemes in Andhra Pradesh just a few years ago." These questions will be taken up in the larger survey through qualitative interviews with the beneficiaries and implementing officers, among others.

[11] Jha et al. (2008)
[12] Source: http://www.europe-solidaire.org/spip.php?article9169

Table 13
Tobit Analysis of Duration of Participation in NREGA (1)

```
Tobit regression                                  Number of obs   =        602
                                                  LR chi2(10)     =     101.58
                                                  Prob > chi2     =     0.0000
Log likelihood = -1841.5449                       Pseudo R2       =     0.0268

------------------------------------------------------------------------------
      n_days |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          pp |   157.2539    146.722     1.07   0.284    -130.9052    445.4129
  _Iland_g_2 |  -3.209479    6.02795    -0.53   0.595    -15.04825     8.62929
  _Iland_g_3 |  -.8851323   6.231989    -0.14   0.887    -13.12463    11.35436
  _Iland_g_4 |  -11.25354   53.00774    -0.21   0.832    -115.3596    92.85256
  _Iland_g_5 |   -.153254   61.41734    -0.00   0.998    -120.7756    120.4691
         a_m |  -.4786284   5.020691    -0.10   0.924    -10.33916    9.381906
         a_f |  -.5212834   4.399491    -0.12   0.906    -9.161792    8.119225
      hhsize |  -1.037835   6.847729    -0.15   0.880    -14.48663    12.41096
 _Ivillage_2 |  -31.17188    71.3396    -0.44   0.662    -171.2814    108.9376
 _Ivillage_3 |   4.826853    11.9573     0.40   0.687    -18.65704    28.31075
       _cons |  -61.35796   31.14911    -1.97   0.049    -122.5342   -.1817448
-------------+----------------------------------------------------------------
      /sigma |   51.56401   2.309699                      47.02781    56.10021
------------------------------------------------------------------------------
  Obs. summary:        293  left-censored observations at n_days<=0
                       309     uncensored observations
                         0 right-censored observations
```

Table 14

Tobit Analysis of Duration of Participation in NREGA (2)

```
Tobit regression                                  Number of obs   =        602
                                                  LR chi2(8)      =     102.25
                                                  Prob > chi2     =     0.0000
Log likelihood =  -1841.212                       Pseudo R2       =     0.0270

------------------------------------------------------------------------------
      n_days |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          pp |   178.4532    34.0604     5.24   0.000     111.5597    245.3466
 _Icaste_r_2 |  -2.065768   5.468348    -0.38   0.706    -12.80542     8.67388
 _Icaste_r_3 |   7.111903   8.261701     0.86   0.390    -9.113795     23.3376
         a_m |   .1383657   3.540566     0.04   0.969    -6.815184    7.091915
         a_f |  -.8720428   3.898346    -0.22   0.823    -8.528261    6.784175
      hhsize |   -2.09735   2.681177    -0.78   0.434     -7.36309     3.16839
 _Ivillage_2 |  -42.34417     17.199    -2.46   0.014    -76.12243   -8.565917
 _Ivillage_3 |   2.719358   6.433322     0.42   0.673    -9.915467    15.35418
       _cons |   -65.7814   11.36492    -5.79   0.000    -88.10171    -43.4611
-------------+----------------------------------------------------------------
      /sigma |   51.56151   2.309171                      47.02638    56.09664
------------------------------------------------------------------------------
  Obs. summary:        293  left-censored observations at n_days<=0
                       309     uncensored observations
                         0 right-censored observations
```

Table 15
Tobit Analysis of Duration of Participation in NREGA (3)

```
Tobit regression                                  Number of obs   =        602
                                                  LR chi2(9)      =     116.47
                                                  Prob > chi2     =     0.0000
Log likelihood = -1834.1001                       Pseudo R2       =     0.0308

------------------------------------------------------------------------------
      n_days |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          pp |   176.4746   33.99884     5.19   0.000     109.7018    243.2474
_Ioccupati~1 |   34.75503   9.839615     3.53   0.000      15.4303    54.07977
_Ioccupati~4 |   32.77091   10.45713     3.13   0.002     12.23339    53.30844
_Ioccupati~5 |   .1076847   23.54114     0.00   0.996    -46.12647    46.34184
         a_m |   .2378889   3.493208     0.07   0.946    -6.622675    7.098453
         a_f |  -.3726374   3.846443    -0.10   0.923    -7.926945     7.18167
      hhsize |  -2.030587   2.643963    -0.77   0.443    -7.223257    3.162084
 _Ivillage_2 |  -41.79072   16.94805    -2.47   0.014    -75.07623   -8.505215
 _Ivillage_3 |   6.665282   6.485735     1.03   0.305    -6.072523    19.40309
       _cons |   -98.2158   14.98211    -6.56   0.000    -127.6402   -68.79136
-------------+----------------------------------------------------------------
      /sigma |   50.76107   2.269191                      46.30445     55.2177
------------------------------------------------------------------------------
  Obs. summary:        293  left-censored observations at n_days<=0
                       309     uncensored observations
                         0 right-censored observations
```

Concluding Observations

The preceding analysis based on a small survey in Andhra Pradesh confirms pro-poor targeting of NREGA, using different (proximate) indicators of deprivation-caste/ethnic affiliation, landlessness, and occupation. In contrast to Rajasthan, SC and ST participated in higher numbers in AP, but in both states these groups participated for slightly lower spells than the residual group of 'Others'. But the number of days worked on average was much higher than suggested by other assessments**.** Our econometric analysis further reinforces the view that not only disadvantaged groups are more likely to participate but also for longer spells. Although based on small samples for just two states, these results offer a more optimistic perspective on this scheme than other recent assessments.

Appendix: Definitions of variables used

N- non-participant in NREG

Y-participant in NREG

SC-Scheduled caste

ST-Scheduled tribe

OT-"Others"

AL-Agricultural labour

OL-Other Labour

OT-"Others"

SA-Self-Employed in agriculture

SN-Self-employed in non-agriculture

Ioccupation -1-agricultural labour

Ioccupation-2-Other labour

Ioccupation-4-self-employed in agriculture

Ioccupation-5-Self-employed in non-agriculture

Iland_g_2- 0.1 to 0.75 ha (land ownership)

Iland_g_3- 0.75 to 1.5 ha (land ownership)

Iland_g_4- 1.5 to 2.5 ha (land ownership)

Iland_g_5- larger than 2.5 ha (land ownership)

lcaste_r_2-dummy variable takes the value 1 for SC and 0 otherwise

lcaste_r_3-dummy variable takes the value 1 for ST and 0 otherwise

a_m-number of adult males

a_f-number of adult females

hhsize-household size (number of persons)

village 1-Kaligiri (omitted from probits and tobits)

Ivillage_2-Obulayyapale

Ivillage_3-Reddivaripalle

pp-predicted probability of participation in NREG

References

Besley, T. and S. Coate (1992) "Workfare versus Welfare:Incentive Arguments for Work-Requirements in Poverty Alleviation Programmes", *American Economic Review*, vol. 82.

CAG (2007) *Review of NREGA* (draft report submitted to the Ministry of Rural Development).

Economic and Political Weekly (2008) "Wake-Up Call on Rural Employment Guarantee", 26 January.

Dreze, J. (2007) "NREGA: Dismantling the Contractor Raj", *The Hindu*, 20 November.

Dreze,J., R.Khera and Siddharta (2008) "Corruption in NREGA: Myths and Reality", The Hindu, Jan 22, 2008

Gaiha, R. (2000) "Do Anti-Poverty Programmes Reach the Rural Poor in India?", *Oxford Development Studies*, vol. 28.

Greene, W. H. (1993) *Econometric Analysis*, New York: Macmillan.

Himmelfarb, G. (1984) *The Idea of Poverty*, New York: Knopf.

Jha, R., R. Gaiha and S. Shankar (2008) **"**National Rural Employment Guarantee Programme in India -A Review" Canberra: ASARC Working paper no**.**

Outlook (2007) "There's No Guarantee", 1 October,