National Rural Employment Guarantee Programme in India — A Review[#]

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Abstract

This paper presents results on the participation of rural workers in the National Rural Employment Guarantee Program based on a pilot survey of three villages in Udaipur district, Rajasthan, India. Three villages (Dhundiya, Karanpur and Prithvisingh Ji Ka Khera) were covered. Total number of households interviewed in December, 2007, was 340. Here the focus is on participation in NREG of different socio-economic groups and the determinants of the participation of these groups. It is discovered that the mean participation was 59 days and that targeting was efficient with other labour, self employed in agriculture, SC and ST as well as those with smaller landholdings benefiting the most from the program. Thus the performance of the National Rural Employment Guarantee program has been far from dismal.

Keywords: National Rural Employment Guarantee Program
JEL Classification No. C25, C81, D69, I38

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[#] We are grateful to ARC-AusAID Linkage grant LP0775444 for financial support and Raj Bhatia for help with the computations. The usual disclaimer applies.
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I. Introduction

There has been a spate of comments — mostly critical — following an audit of National Rural Employment Guarantee (henceforth NREGP) Programme by the Comptroller and Auditor General of India (CAG, 2007). This audit has revealed several weaknesses of this anti-poverty programme and huge leakages. For example, a bare 3.2 per cent of registered needy households in 200 of India's poorest districts managed to get the guaranteed hundred days of employment in a year.[2] The average employment provided was 18 days per needy household. Another assessment (Biswas, 2007) draws attention to the unevenness in its implementation. Emphasising that while a total estimated expenditure of $4.5 billion was expected to generate 2 billion days of employment, the actual was about 1 billion, and the benefits varied across different states. In Uttar Pradesh, the most populous state, large segments of the rural population were ignorant of the scheme. By contrast, Rajasthan was among the top performers-the average employment per participating household was 77 days of work. The share of wages was 73 per cent. The small north-eastern state of Tripura performed well too, as the average number of days of employment per rural family was 87 days. Somewhat surprisingly, Kerala-a state with a superb record of human development-was at the bottom. In fact, only one of the southern and western states (Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu)-Karnataka- generated more than 10 days of employment per rural family during 2006-07, while the eastern and northern states performed better.

Some encouraging features of this scheme include (i) a high share of female employment (about 40 per cent nationally rising to 81 per cent in Tamil Nadu, and a low of 12 per cent in Himachal Pradesh); (ii) 20 districts spent more than $25 million on this scheme, and the benefits are reflected in greater economic security, higher farm wages, lower migration, and

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

[2] 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). See also an admirably clear and coherent response to the CAG audit in *Economic and Political Weekly* (January, 26, 2008).

building of infrastructure. However, no general conclusions can be drawn about the accuracy of targeting and prompt disbursal of wages. Two examples suffice. In Chattisgarh, 95 per cent of wages were paid to the actual workers while in eastern Jharkhand the corresponding share was barely 15 per cent.[3] Other failures relate to distribution of job cards — large numbers of needy households are in the queue — the selection, design and execution of projects, resulting in huge leakages.[4] More specifically, Dreze (2007) highlights a quiet sabotage of the transparency safeguards in NREGA in western Orissa. In a survey of 30 worksites, the investigators found evidence that a contractor was involved in some ways. What is worse the job card does not have a column for 'wages paid'. Even the number of days worked is hard to verify, as the names of the labourer and worksite have been replaced by numerical codes. Yet Dreze (2007) and Roy et al. (2008), among others remain optimistic about its potential mainly because the awareness of employment as an entitlement has grown.

II. Objective

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 NREG is operative in six districts of Rajasthan. Our sampling strategy is as follows. Since considerable reduction in the sampling error can be achieved by increasing the number of sample districts without substantially increasing the overall sample size we have selected 50% of the total districts as the first stage units from the total number of districts covered in the NREG scheme in the state. It is often advantageous to select sampling units with unequal probabilities which reduces sampling errors. Thus it is proposed to select districts with PPS sampling at the first stage, size being the rural population/ households as reported in the national census of 2001.

The first set of results given below are based on a pilot survey of three villages in Udaipur district, Rajasthan. Three villages (Dhundiya, Karanpur and Prithvisingh Ji Ka Khera) were

[3] Dreze (2007) points out that a similar survey in Chattisgargh two years ago had uncovered evidence of massive fraud in the National Food for Work Program.

[4] 'A minimum of 5 per cent of the funds goes to line the pockets of the CEO who oversees the project, 10 per cent goes to the engineering officials, 5 to the zilla panchayat, and another 10 to panchayat officials. The percentages can be much higher in some districts and states. Add to these percentages the fact that in many cases funds are allocated for the same project several times, or shortcuts by the officials lead to shoddy implementation and other irregularities' (*Outlook*, 2007, pp.55–56).

covered.[5] Total number of households interviewed in December, 2007, was 340. Here the focus is on participation in NREG of different socio-economic groups and the determinants of the participation of these groups.

III. Methodology

First**,** a set of cross-tabulations are given to identify the correlates of participation in NREG. 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.

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]

[5] In both Dhundiya and Karanpur, every third household was interviewed while in the third there was complete enumeration.

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

The marginal effects are computed as

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

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

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

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]

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*),

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

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:

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

The tobit model is estimated using Maximum Likelihood.

[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).

IV. 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.

Cross-Tabulations

In the cross-tabulations an attempt is made to identify some correlates of participation and duration of participation in NREG. This is depicted[9] in Table 1.

Table 1
Participation in NREG by Caste/Ethnic Group[1]

nreg	caste OT	SC	ST	Total
N	205	18	4	227
	90.31	7.93	1.76	100.00
	66.78	75.00	44.44	66.76
	60.29	5.29	1.18	66.76
Y	102	6	5	113
	90.27	5.31	4.42	100.00
	33.22	25.00	55.56	33.24
	30.00	1.76	1.47	33.24
Total	307	24	9	340
	90.29	7.06	2.65	100.00
	100.00	100.00	100.00	100.00
	90.29	7.06	2.65	100.00

1. Key
frequency
row percentage
column percentage
cell percentage

Out of 340 households, one third participated in NREG (Y). A vast majority of the participants belonged to ‘Others’ (about 90 per cent) and the remaining were equally divided among the SC and ST. Within each caste/ ethnic group, the highest proportion of participants was among the ST, followed by ‘Others’.

Table 2 shows that Self-Employed in agriculture households accounted for about 46 per cent of the participants, followed by ‘Other Labour’ households. Within each occupation, the proportion of participants was, however, highest among ‘Other Labour’, followed by the Self-Employed in agriculture.

[9] The appendix describes the variables used in our analysis.

Table 2
Participation in NREG by Occupation

	ocp					
nreg	AL	OL	OT	SA	SN	Total
N	4	28	16	126	53	227
	1.76	12.33	7.05	55.51	23.35	100.00
	80.00	37.84	84.21	70.79	82.81	66.76
	1.18	8.24	4.71	37.06	15.59	66.76
Y	1	46	3	52	11	113
	0.88	40.71	2.65	46.02	9.73	100.00
	20.00	62.16	15.79	29.21	17.19	33.24
	0.29	13.53	0.88	15.29	3.24	33.24
Total	5	74	19	178	64	340
	1.47	21.76	5.59	52.35	18.82	100.00
	100.00	100.00	100.00	100.00	100.00	100.00
	1.47	21.76	5.59	52.35	18.82	100.00

Table 3 depicts participation in NREG by land-owned category. As land continues to be an important asset in rural areas, it is not surprising that the bulk of the participants (about 80 per cent) belonged to three lowest ranges of land owned. The share of participants was highest among the (nearly) landless (about 52 per cent), followed by each of the three higher land categories.

Table 3
Participation in NREG by Landowned (Ha)

nreg	0-0.1ha	0.1-0.75h	0.75-1.5h	1.5-2.5ha	>2.5ha	Total
N	28	56	75	39	29	227
	12.33	24.67	33.04	17.18	12.78	100.00
	48.28	66.67	69.44	69.64	85.29	66.76
	8.24	16.47	22.06	11.47	8.53	66.76
Y	30	28	33	17	5	113
	26.55	24.78	29.20	15.04	4.42	100.00
	51.72	33.33	30.56	30.36	14.71	33.24
	8.82	8.24	9.71	5.00	1.47	33.24
Total	58	84	108	56	34	340
	17.06	24.71	31.76	16.47	10.00	100.00
	100.00	100.00	100.00	100.00	100.00	100.00
	17.06	24.71	31.76	16.47	10.00	100.00

Table 4 details participation in NREG by household size. About 42 per cent of the participating households had 5 or more members, and a little over one-fifth were small (comprising1-3 members). However, the share of participants was highest among the latter (about 43 per cent).

Table 4
Participation in NREG by Household Size

nreg	1-3	4-5	>5	Total
N	33	87	107	227
	14.54	38.33	47.14	100.00
	56.90	67.97	69.48	66.76
	9.71	25.59	31.47	66.76
Y	25	41	47	113
	22.12	36.28	41.59	100.00
	43.10	32.03	30.52	33.24
	7.35	12.06	13.82	33.24
Total	58	128	154	340
	17.06	37.65	45.29	100.00
	100.00	100.00	100.00	100.00
	17.06	37.65	45.29	100.00

Contrary to the findings of CAG and 'Others', the share of participating households that worked for 90 days or more in 2007 was a little over one fifth. About 39 per cent worked for 50 to 90 days. So a large majority worked for a fairly long duration. In fact, the mean number of days worked was high-about 59 days in the last year.

Some basic characteristics of participation in these three villages are reported in Table 5.

Table 5
Duration of Participation in NREG

nreg	0 days	1-50days	51-90days	>90days	Total
N	227	0	0	0	227
	100.00	0.00	0.00	0.00	100.00
	100.00	0.00	0.00	0.00	66.76
	66.76	0.00	0.00	0.00	66.76
Y	0	46	44	23	113
	0.00	40.71	38.94	20.35	100.00
	0.00	100.00	100.00	100.00	33.24
	0.00	13.53	12.94	6.76	33.24
Total	227	46	44	23	340
	66.76	13.53	12.94	6.76	100.00
	100.00	100.00	100.00	100.00	100.00
	66.76	13.53	12.94	6.76	100.00

The first entry in the *N* headed-row of Table 5 indicates the number of responses (227) listing 0 days and the other rows indicate row, column and overall percentages.[10] Table 6 provides analogous details of basic statistics of such participation whereas Table 7 associates NREG participation with ethnic groups.

[10] A similar interpretation applies to the other columns of Table 5 and the *Y* and *T*- headed rows in Table 5 as well as in Tables 6 to 12.

Table 6
Duration of Participation in NREG (Means, SD, Frequency of Days)

nreg	0 days	1-50days	51-90days	>90days	Total
N	0	.	.	.	0
	0	.	.	.	0
	227	0	0	0	227
Y	.	34	64.727273	100	59.39823
	.	9.8680179	8.5463541	0	26.111211
	0	46	44	23	113
Total	0	34	64.727273	100	19.741176
	0	9.8680179	8.5463541	0	31.787422
	227	46	44	23	340

Table 7
Duration of Participation in NREG by Caste/Ethnic Group

caste	0 days	1-50days	51-90days	>90days	Total
OT	205	39	40	23	307
	66.78	12.70	13.03	7.49	100.00
	90.31	84.78	90.91	100.00	90.29
	60.29	11.47	11.76	6.76	90.29
SC	18	4	2	0	24
	75.00	16.67	8.33	0.00	100.00
	7.93	8.70	4.55	0.00	7.06
	5.29	1.18	0.59	0.00	7.06
ST	4	3	2	0	9
	44.44	33.33	22.22	0.00	100.00
	1.76	6.52	4.55	0.00	2.65
	1.18	0.88	0.59	0.00	2.65
Total	227	46	44	23	340
	66.76	13.53	12.94	6.76	100.00
	100.00	100.00	100.00	100.00	100.00
	66.76	13.53	12.94	6.76	100.00

The contrast revealed by Table 7 is striking. All those who worked for 90 days or more belonged to 'Others'. Among the SC and ST, one-third or more worked for 51-90 days, and the majority worked for fewer days (between 1-50 days). Thus while most groups had access to employment under the NREG, SC and ST seem to have benefited relatively less.

Table 8 reports on basic statistics of NREG participation by ethnic group. The mean number of days worked did not differ much in the range (51–90 days), as also in the lowest range (1–50 days).

Table 8
Duration of Participation in NREG (Mean, SD and Frequency of Households)

caste	0 days	1-50days	51-90days	>90days	Total
OT	0	33.564103	65.2	100	20.250814
	0	10.192347	8.8323415	0	32.593139
	205	39	40	23	307
SC	0	33.75	60	.	10.625
	0	7.5	0	.	20.016976
	18	4	2	0	24
ST	0	40	60	.	26.666667
	0	8.660254	0	.	26.809513
	4	3	2	0	9
Total	0	34	64.727273	100	19.741176
	0	9.8680179	8.5463541	0	31.787422
	227	46	44	23	340

Table 9 reports on participation in NREG by occupational category, whereas Table 10 reports on the associated basic statistics.

Table 9
Duration of Participation in NREG by Occupation

ocp	0 days	1-50days	51-90days	>90days	Total
AL	4	1	0	0	5
	80.00	20.00	0.00	0.00	100.00
	1.76	2.17	0.00	0.00	1.47
	1.18	0.29	0.00	0.00	1.47
OL	28	13	16	17	74
	37.84	17.57	21.62	22.97	100.00
	12.33	28.26	36.36	73.91	21.76
	8.24	3.82	4.71	5.00	21.76
OT	16	3	0	0	19
	84.21	15.79	0.00	0.00	100.00
	7.05	6.52	0.00	0.00	5.59
	4.71	0.88	0.00	0.00	5.59
SA	126	22	25	5	178
	70.79	12.36	14.04	2.81	100.00
	55.51	47.83	56.82	21.74	52.35
	37.06	6.47	7.35	1.47	52.35
SN	53	7	3	1	64
	82.81	10.94	4.69	1.56	100.00
	23.35	15.22	6.82	4.35	18.82
	15.59	2.06	0.88	0.29	18.82
Total	227	46	44	23	340
	66.76	13.53	12.94	6.76	100.00
	100.00	100.00	100.00	100.00	100.00
	66.76	13.53	12.94	6.76	100.00

Table 10
Duration of Participation in NREG by Occupation
(mean, SD, and Frequency of Households)

ocp	0 days	1-50days	51-90days	>90days	Total
AL	0	45	.	.	9
	0	0	.	.	20.124612
	4	1	0	0	5
OL	0	35.769231	67.0625	100	43.756757
	0	7.8650476	10.003125	0	40.400329
	28	13	16	17	74
OT	0	29	.	.	4.5789474
	0	13.527749	.	.	11.763011
	16	3	0	0	19
SA	0	33.954545	63.8	100	15.966292
	0	10.81215	7.8102497	0	27.685461
	126	22	25	5	178
SN	0	31.428571	60	100	7.8125
	0	9.4491118	0	0	19.657282
	53	7	3	1	64
Total	0	34	64.727273	100	19.741176
	0	9.8680179	8.5463541	0	31.787422
	227	46	44	23	340

The variation in duration of participation across occupations is striking too. All agricultural labour households worked in the range 1 to 50 days while the majority of Other Labour participating households worked in the ranges 51 to 90 and greater than 90 days. The majority of the Self-Employed in agriculture also worked in these high ranges. Among the Self-Employed in non-agriculture, the majority worked in the lowest range. This implies that agricultural labourers and self-employed in non-agriculture relied on NREG to supplement their incomes whereas workers in the other labour and self-employed in agriculture categories used NREG as the mainstay of their incomes.

Table 11 reports on participation in NREG by asset ownership, in particular, land, whereas Table 12 details the associated summary statistics.

The majority of (nearly) landless worked in the ranges 51 to 90 and greater than 90 days, as also those in land owned groups 0.75 to 1.5 ha and 1.5 to 2.5 ha. All participants from the highest land owned group (larger than 2.5 ha) were concentrated in the lowest range of days worked (i.e. 1 to 50 days). The mean number of days worked in each range of days worked, however, varied little across different land owned groups (with the exception of the highest land owned group). Thus the NREG program seems to have been well targeted by asset class.

Table 11
Duration of Participation in NREG by Landowned (Ha)

land_ha	0 days	1-50days	51-90days	>90days	Total
0-0.1ha	28	7	10	13	58
	48.28	12.07	17.24	22.41	100.00
	12.33	15.22	22.73	56.52	17.06
	8.24	2.06	2.94	3.82	17.06
0.1-0.75ha	56	14	8	6	84
	66.67	16.67	9.52	7.14	100.00
	24.67	30.43	18.18	26.09	24.71
	16.47	4.12	2.35	1.76	24.71
0.75-1.5ha	75	15	16	2	108
	69.44	13.89	14.81	1.85	100.00
	33.04	32.61	36.36	8.70	31.76
	22.06	4.41	4.71	0.59	31.76
1.5-2.5ha	39	5	10	2	56
	69.64	8.93	17.86	3.57	100.00
	17.18	10.87	22.73	8.70	16.47
	11.47	1.47	2.94	0.59	16.47
>2.5ha	29	5	0	0	34
	85.29	14.71	0.00	0.00	100.00
	12.78	10.87	0.00	0.00	10.00
	8.53	1.47	0.00	0.00	10.00
Total	227	46	44	23	340
	66.76	13.53	12.94	6.76	100.00
	100.00	100.00	100.00	100.00	100.00
	66.76	13.53	12.94	6.76	100.00

Table 12
Duration of Participation in NREG by Landowned
(Mean, SD and Frequency of Households)

land_ha	0 days	1-50days	51-90days	>90days	Total
0-0.1ha	0	39.285714	70.3	100	39.275862
	0	7.3192505	11.489609	0	42.356794
	28	7	10	13	58
0.1-0.75h	0	33.571429	67.5	100	19.166667
	0	9.078413	11.019463	0	31.67829
	56	14	8	6	84
0.75-1.5h	0	31.6	62.5	100	15.5
	0	9.7453286	5.4772256	0	26.175361
	75	15	16	2	108
1.5-2.5ha	0	31	60.5	100	17.142857
	0	13.874437	1.5811388	0	28.839007
	39	5	10	2	56
>2.5ha	0	38	.	.	5.5882353
	0	10.954451	.	.	14.183041
	29	5	0	0	34
Total	0	34	64.727273	100	19.741176
	0	9.8680179	8.5463541	0	31.787422
	227	46	44	23	340

Figures 1 and 2 illustrate that the proportion of ST participating was the highest but the number of days worked was highest among 'Others'.

Fig:1 Participation by Social Group

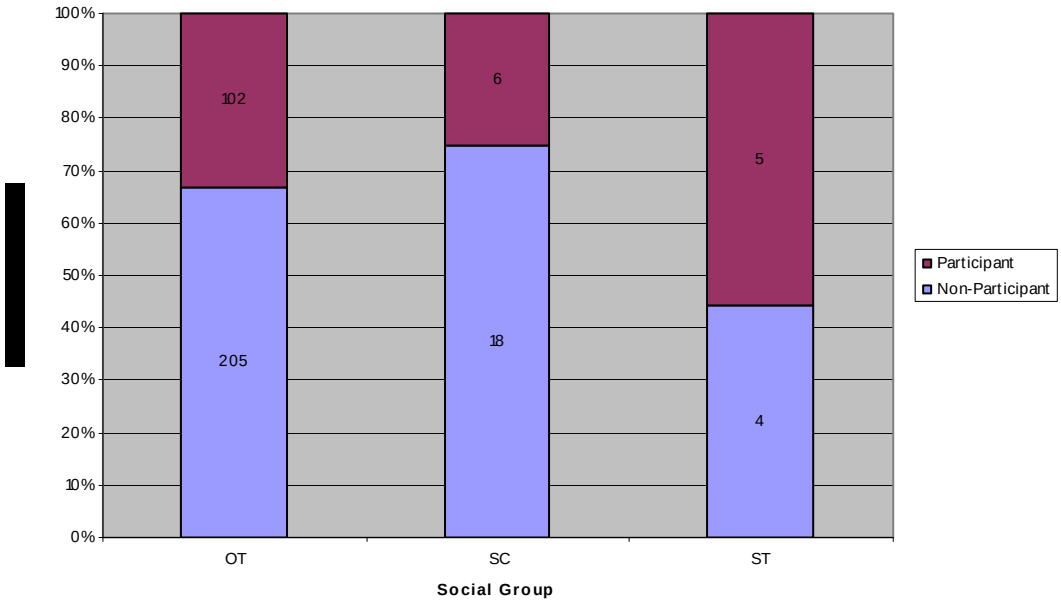
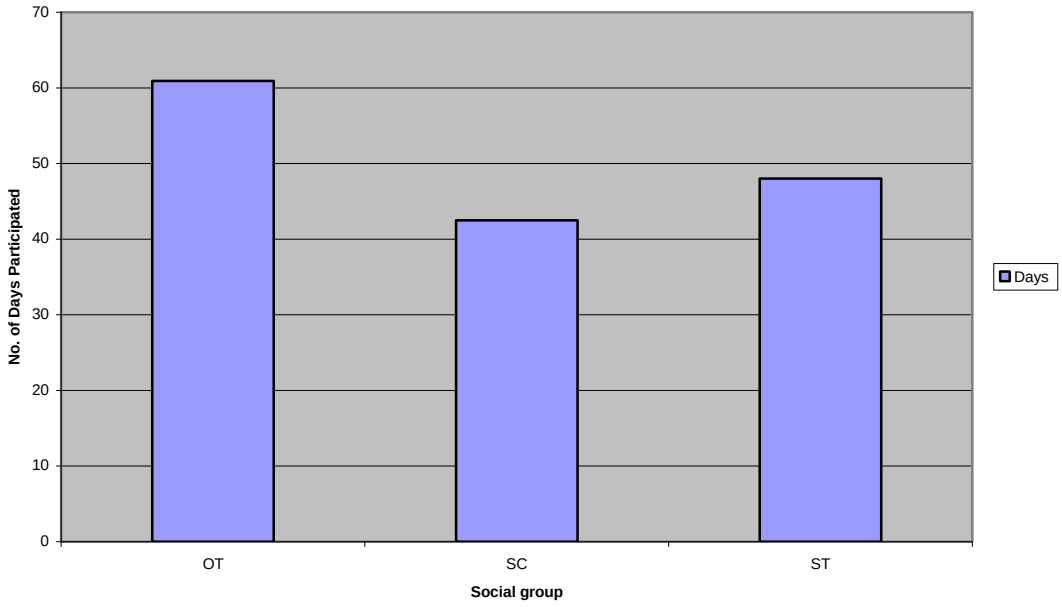


Fig:2 Average Number of Days by Social Group



Other Labour households worked highest number of days, followed by Self-Employed in agriculture, as indicated above and as shown in Figure 3. Figure 4 illustrates that the (nearly) landless had the longest duration of participation, followed by those in the land owned group 1.5 to 2.5 ha.

Fig:3 Average Number of Days by Occupation

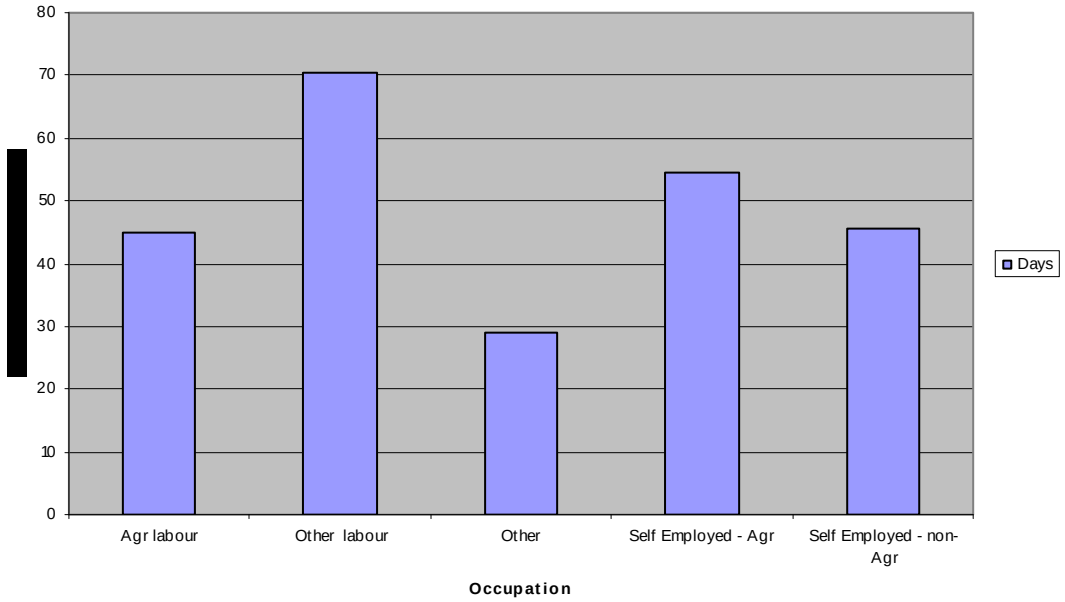
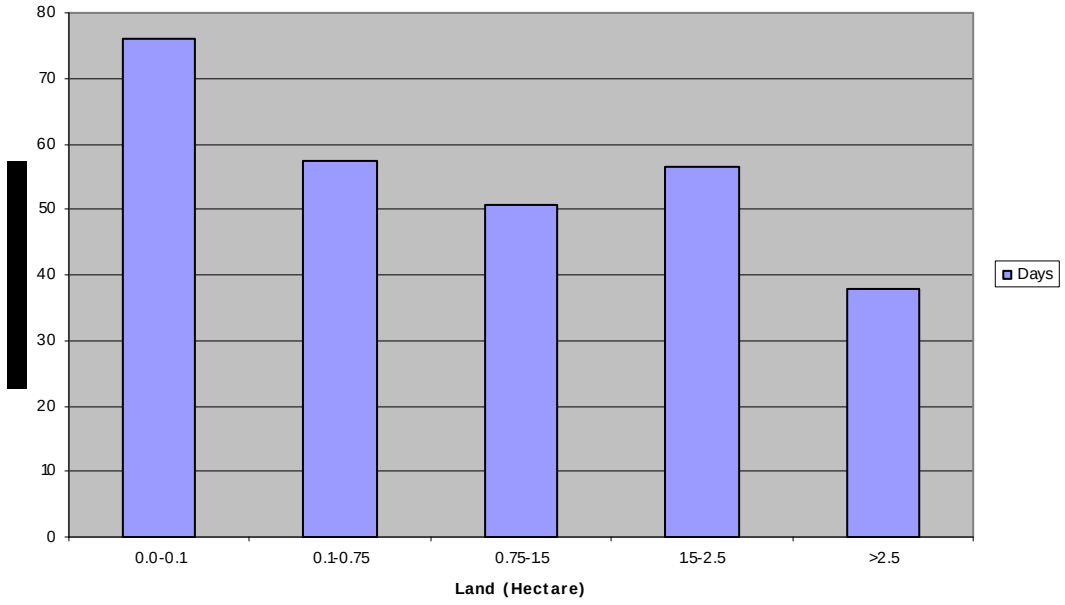


Fig:4 Average Number of Days by Landowned



In sum, both in terms of participation and duration of participation, the targeting of NREG was far from dismal.

Determinants of Participation in NREG

Three sets of probit results are given in Tables 13 to 15. As the overlaps between caste/ethnic groups, occupational status and landowned are non-negligible, we have used one or the other characteristic. In Table 13, we use caste dummies (one for the SC and another for the ST with 'Others' as the omitted group).

Table 13
Determinants of Participation in NREG(1)

Probit regression — Number of obs = 340; LR chi2(7) = 123.40; Prob > chi2 = 0.0000; Log likelihood = -154.48167; Pseudo R2 = 0.2854

Participant	Coef.	Std. Err.	Z	P>|z|	[95% Conf.	Interval]
_Icaste_r_2	.2254922	.2962295	0.76	0.447	-.3551069	.8060913
_Icaste_r_3	.7441397	.44101	1.69	0.092	-.1202241	1.608503
a_m	-.2225432	.1332552	-1.67	0.095	-.4837185	.0386321
a_f	-.2396522	.1505574	-1.59	0.111	-.5347392	.0554348
hhsize	.0889981	.0532106	1.67	0.094	-.0152929	.193289
_Ivillage_2	-.6297168	.1739026	-3.62	0.000	-.9705596	-.2888741
_Ivillage_3	2.183292	.3498931	6.24	0.000	1.497514	2.86907
_cons	-.2297392	.2288935	-1.00	0.316	-.6783622	.2188837

The dummy for the ST has a positive and significant coefficient, suggesting that the ST are more likely to participate relative to 'Others'. The larger the number of adult males and females, the lower is the probability of participation in this scheme. However, the larger the household size, the higher is the probability of participation. While Karanpur (village 2) has a significantly lower probability, Prithvisingh Ji Ka Khera (village 3) has a significantly higher probability of participation than Dhundiya (the omitted village). The overall specification is validated by the chi-square test.

In Table 14, the caste dummies are replaced by occupational categories (agricultural labour, labour, 'Others' (omitted), self employed in agriculture and self-employed in non-agriculture). The self-employed households are more likely to participate in NREG than the omitted group. All other occupational dummies have non-significant coefficients. An increase in the number of adult males and females lowers the probability of participation. However, the positive coefficient of household size ceases to be significant.[11] Both village dummies have coefficients similar to those in the previous specification.

[11] This probably indicates the effect of higher number of dependents.

Table 14
Determinants of Participation in NREG (2)

Probit regression — Number of obs = 340; LR chi2(9) = 124.24; Prob > chi2 = 0.0000; Log likelihood = -154.06518; Pseudo R2 = 0.2873

participant	Coef.	Std. Err.	Z	P>|z|	[95% Conf.	Interval]
_Ioccupati~1	.0351215	.7600641	0.05	0.963	-1.454577	1.52482
_Ioccupati~2	.6056738	.4207937	1.44	0.150	-.2190666	1.430414
_Ioccupati~4	.6372703	.3766862	1.69	0.091	-.1010211	1.375562
_Ioccupati~5	.4586123	.4232803	1.08	0.279	-.3710018	1.288226
a_m	-.2165832	.1343803	-1.61	0.107	-.4799637	.0467973
a_f	-.2405859	.1532363	-1.57	0.116	-.5409235	.0597517
hhsize	.0810263	.0537139	1.51	0.131	-.0242511	.1863037
_Ivillage_2	-.6887547	.1805794	-3.81	0.000	-1.042684	-.3348256
_Ivillage_3	2.041357	.3735463	5.46	0.000	1.30922	2.773495
_cons	-.6680085	.3958537	-1.69	0.092	-1.443867	.1078505

Our preferred specification is shown in Table 15. The occupational dummies are replaced by land owned dummies (0 to 0.1 ha (omitted group), 0.1 to 0.75 ha, 0.75 to 1.5 ha, 1.5 to 2.5 ha, and larger than 2.5 ha). All land dummies except that for the highest land owned group have significant positive coefficients, implying higher probabilities of participation relative to the (nearly) landless. Probability of participation decreases with number of adult males and females but rises with household size. The village dummies have effects similar to those in the earlier specifications.

Table 15
Determinants of Participation in NREG (3)

Probit regression — Number of obs = 340; LR chi2(9) = 128.53; Prob > chi2 = 0.0000; Log likelihood = -151.91997; Pseudo R2 = 0.2973

participant	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_Iland_g_2	.5825464	.330061	1.76	0.078	-.0643613	1.229454
_Iland_g_3	.758315	.3151825	2.41	0.016	.1405686	1.376061
_Iland_g_4	.6700685	.3508152	1.91	0.056	-.0175166	1.357654
_Iland_g_5	.2354679	.4000868	0.59	0.556	-.5486878	1.019624
a_m	-.2107726	.1344599	-1.57	0.117	-.4743092	.0527641
a_f	-.2811701	.1539963	-1.83	0.068	-.5829974	.0206572
hhsize	.0881745	.0543562	1.62	0.105	-.0183617	.1947108
_Ivillage_2	-.6778212	.1765229	-3.84	0.000	-1.0238	-.3318427
_Ivillage_3	2.462004	.3961954	6.21	0.000	1.685476	3.238533
_cons	-.6842052	.3430846	-1.99	0.046	-1.356639	-.0117719

The marginal effects for the specification used in Table 15 allow us to assess the relative importance of various determinants of participation. As may be noted from Table 16, the

highest marginal effect among the land owned dummies is associated with the third dummy (i.e. households owning land between 0.75 to 1.5 ha), followed by the next higher range of land owned. The negative effect of number of adult females is larger (in absolute value) than that of adult males while that of household size is relatively small. Between the village dummies, the (absolute) effect of the third is larger.

Table 16
Determinants of Participation in NREG (Marginal Effects)

```
Probit regression, reporting marginal effects           Number of obs =    340
                                                        LR chi2(9)    = 128.53
                                                        Prob > chi2   = 0.0000
Log likelihood = -151.91997                             Pseudo R2     = 0.2973


partic~t |      dF/dx   Std. Err.      Z    P>|z|     x-bar  [    95% C.I.   ]
---------+--------------------------------------------------------------------
_Iland~2*|    .218754   .1262998     1.76   0.078   .247059  -.028789  .466297
_Iland~3*|   .2815091   .1167218     2.41   0.016   .317647   .052739   .51028
_Iland~4*|   .2556942   .1358099     1.91   0.056   .164706  -.010488  .521877
_Iland~5*|    .087793   .1536823     0.59   0.556        .1  -.213419  .389005
     a_m |  -.0757644   .0483398    -1.57   0.117   1.62647  -.170509   .01898
     a_f |  -.1010695   .0553256    -1.83   0.068       1.7  -.209506  .007367
  hhsize |   .0316952   .0195691     1.62   0.105   5.50882  -.006659   .07005
_Ivill~2*|  -.2345264   .0572666    -3.84   0.000   .426471  -.346767 -.122286
_Ivill~3*|   .7379032   .0481962     6.21   0.000   .135294    .64344  .832366
---------+--------------------------------------------------------------------
  obs. P |   .3323529
 pred. P |   .3240018  (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
```

Tobit results on the determinants of duration of participation are obtained by combining the (predicted) probabilities of participation and other household and village characteristics. The greater the probability of participation, the longer is the duration of participation in NREG. All land owned dummies have significant negative coefficients, implying lower durations of participation relative to that of the (nearly) landless. The larger the number of adult males and females, the longer is the duration of participation. Household size, however, has a negative effect on number of days of participation. The duration is higher in the second village and lower in the third, relative to that in the omitted village. The overall specification is validated by the chi-square test.

Table 17
Determinants of Duration of Participation in NREG

```
Tobit regression                                  Number of obs   =        340
                                                  LR chi2(10)     =     170.17
                                                  Prob > chi2     =     0.0000
Log likelihood = -689.42865                       Pseudo R2       =     0.1099

------------------------------------------------------------------------------
      n_days |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          pp |   400.2426    94.8115     4.22   0.000     213.7315    586.7538
  _Iland_g_2 |   -26.3615   14.07078    -1.87   0.062    -54.04123    1.318235
  _Iland_g_3 |   -37.7038   19.08307    -1.98   0.049    -75.24361   -.1639841
  _Iland_g_4 |  -30.99989   17.66301    -1.76   0.080    -65.74619    3.746412
  _Iland_g_5 |  -6.731264   16.20129    -0.42   0.678     -38.6021    25.13957
         a_m |   15.85228   7.009551     2.26   0.024     2.063236    29.64131
         a_f |   18.04148   9.011511     2.00   0.046     .3142311    35.76873
      hhsize |  -5.490571   2.923558    -1.88   0.061    -11.24173    .2605906
 _Ivillage_2 |   46.11892   20.17816     2.29   0.023     6.424879    85.81297
 _Ivillage_3 |  -166.4416   62.33432    -2.67   0.008    -289.0644   -43.81888
       _cons |  -149.7518   33.88132    -4.42   0.000    -216.4024   -83.10121
-------------+----------------------------------------------------------------
      /sigma |   47.76425    3.64895                      40.58611    54.94238
------------------------------------------------------------------------------
  Obs. summary:        227  left-censored observations at n_days<=0
                       113     uncensored observations
                         0 right-censored observations
```

V. Conclusions

Although based on the evidence from three villages in one district in Rajasthan, the targeting accuracy of the NREG was far from dismal. First, nearly one third of the households participated in this scheme. Secondly, large segments of highly disadvantaged groups such as the ST, the landless and labour households participated in it. Thirdly, about one fifth of the households worked for about 100 days during 2007. Also, the landless and labour households participated for long durations.

Our econometric evidence further confirms that the targeting was not unsatisfactory. The disadvantaged groups (proxied by the ST, and the landless households) had significantly high probabilities of participating in NREG thus validating Dreze and Roy's optimism. This, however, should not be taken to imply that relatively affluent households were screened out. In fact, the probability of participation was higher in households owning moderate quantities of land or among the Self-Employed in agriculture. Thus the critics of NREGP are also right that the performance has not been uniformly successful. A lot more work needs to be done, as Roy et al. (2008) rightly says, to ensure sound planning and to overcome political apathy. Even if the focus is on duration of participation (number of days worked in NREG), an important result is that the higher the probability of participation, the longer was the duration

of participation. Also, controlling for this effect, the duration was inversely related to land owned. Finally, even within the same district, there were significant village effects in both participation and duration of participation in NREG. On the basis of our pilot survey, however, it is difficult to disentangle the variation due to implementation failures and differences in demand.

References

Biswas, S. (2007) 'India Job Scheme "Disappointing"', BBC News, 10 November.

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.

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

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

Roy, A.J. Dreze and N. Dey (2008) 'Finish the Job' *Hindustan Times,* 31 January.

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
Iland_g_3- 0.75 to 1.5 ha
Iland_g_4- 1.5 to 2.5 ha
Iland_g_5- larger than 2.5 ha
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)
Ivillage_2-Karanpur
Ivillage_3-Prithvisingh Ji Ka Khera
pp-predicted probability of participation in NREG