Rozgar Guarantee? Assessing India’s Biggest Anti-Poverty Program in India’s Poorest State

Puja Dutta, Rinku Murgai, Martin Ravallion and Dominique van de Walle

World Bank
India’s National Rural Employment Guarantee Scheme (NREGS)

• NREGS is the most ambitious effort India has ever made to directly address absolute poverty.

• Introduced in May 2006, the scheme aims to:
  – guarantee 100 days/ h’hold/year of unskilled work on public works projects in rural areas
  – provides work on demand after h’holds obtain a job card;
  – pay a piece-rate such that a normal worker can earn the state-specific minimum wage rate set for the scheme
  – give women equal wages to men for the same work
**NREGS should be important for Bihar**

- Bihar has the highest rural poverty rate of any Indian state; 50+% in 2009/10. Also high % of rural landless.

- Yet it has a relatively low participation rate in NREGS. *Why?*

**Bihar: highest rural poverty rate (56%) based on 2009/10 NSS and PC poverty lines but one of lowest participation rates (0.22), significantly below the regression line (t=-3.16).**
Large potential impact on poverty in Bihar

- What impact on poverty in rural Bihar if NREGS worked to capacity?
  - Everyone who wants work gets as much as they want up to 100 days of work per household
  - At the stipulated minimum wage rate for the scheme
  - Only fully unemployed people participate, i.e., no forgone income
  - Ignoring assets, savings, financing

12% point reduction in poverty attributable to the direct income gains from BREGS, under these idealized assumptions. (Details later.)
How close does NREGS in Bihar come to achieving its potential impact on poverty?

- *Does NREGS really guarantee employment to anyone who wants it in rural Bihar?* Rationing of employment opportunities may be common.

- Forgone employment and income are unlikely to be zero in reality; poor people cannot afford to be entirely idle, but will find something to help make ends meet. *But how much forgone income?*

- Leakage? Anecdotes that wages are not paid in full; “ghost workers;” contractors use machines and pocket the difference. *But how common in practice?*

*How much impact on poverty in rural Bihar?*
Outline

• Demand for work and rationing
• Wages
• Forgone income
• Impacts on poverty
• Comparisons with other states
• Why so much rationing in poor states?
• What to do to make the scheme work better?
Demand for work and rationing of the available work
A closer look at NREGS in Bihar using our surveys
Survey data for the study

2009 Baseline survey (Round 1; “R1”)
• 3,000 randomly sampled households in 150 villages of rural Bihar surveyed in April-July 2009
• 5,200 adult individuals, one male and one female from each household

(“BREGS: The Movie”: A randomized control trial to test if information can improve performance=> another paper)

2010 Follow-up survey (Round 2; “R2”)
• same villages/households in April-July 2010
Three groups

1. Participants in NREGS
2. “Excess demanders”: those who say they would like to work on NREGS but did not obtain work
3. The rest

<table>
<thead>
<tr>
<th></th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Rural Households who:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>participated in NREGS</td>
<td>22.4</td>
<td>17.6</td>
</tr>
<tr>
<td>excess demanders</td>
<td>43.1</td>
<td>46.9</td>
</tr>
<tr>
<td>rest</td>
<td>34.5</td>
<td>35.6</td>
</tr>
<tr>
<td>% HH who desired participation (participated or wanted to)</td>
<td>65.5</td>
<td>64.4</td>
</tr>
<tr>
<td>% of desired participants who:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>got work in NREG</td>
<td>34.2</td>
<td>27.2</td>
</tr>
<tr>
<td>rationed</td>
<td><strong>65.8</strong></td>
<td><strong>72.8</strong></td>
</tr>
</tbody>
</table>
Does NREGS guarantee employment? No

- Huge excess demand
  - 66% of those households who wanted work on NREGS did not get it in R1; rising to 73% in R2.
- Women are more likely to be excess demanders than to be participants
  - 81% of women versus 62% of men could not get NREGS work when they desired it in R1; 79% and 70% in R2.
Who gets the work?
Who is left out?
Clear signs of pro-poor targeting

- Over the bulk of the data (85%) participation declines as wealth rises
- Poorest 15% are an exception; among this group, higher wealth implies higher participation
- But not just “self-targeting” (whereby non-poor don’t want the work)

Note: Wealth measured by an “assets index” as a function of housing and other assets and durables
The rationing process is also pro-poor

- The probability of being rationed (wanting NREGS work but not getting it) is lower for the poor.
- It is the relatively well-off groups who are rationed most in access to desired work on NREGS.
In summary: 
Substantial and systematic rationing

- Roughly two-thirds of those that want work don’t get it.
- Relatively well-off groups are more likely to be excluded from access when they want it.
- There is a clear gender dimension to the rationing, in that it is more likely for households with a large share of adult women and female headed.
- Predominantly Muslim villages are more likely to be rationed.
- Rationing more likely for those who do not have BPL card and lack political connections.
- Those who are poor but lack the typical profile of the poor appear to be more likely to be excluded from access to the scheme when they want it.
Wages
NREGS is paying more than other casual work

- In R1, PW wage 13% higher than other casual work; 9% R2
- Wages of excess demanders similar to the non-PW wages of NREGS participants
- Those who get the jobs on PW are essentially drawn from the same wage distribution as those who do not get that work, but want it.
- This is again suggestive of rationing in the assignment of jobs.
Yet persistent gap between stipulated wage and reported wage

Mean of actual wage received on NREGS is about 10% lower than the stipulated wage rate

Half the workers earned less than 90% of the stipulated wage rate

Marked seasonality in NREGS employment.
A fuzzy wage floor

- NREGS appears able to provide a higher (though still fuzzy) “wage floor” to participants than other casual workers.

- In R1, only 14% of PW workers earned less than 75% of the min. wage rate, compared to 46% of non-PW workers. (21% & 45% in R2).

- Also find that NREGS is even less effective in providing a wage floor for women than men.
**Women get much better wages under NREGS than in the casual market**

<table>
<thead>
<tr>
<th>Round 1</th>
<th>Mean</th>
<th>St.dev.</th>
<th>Median</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public works</td>
<td>82.73</td>
<td>27.42</td>
<td>89.00</td>
<td>54</td>
</tr>
<tr>
<td>Other casual labor</td>
<td>73.06</td>
<td>32.21</td>
<td>70.00</td>
<td>1050</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public works</td>
<td>85.81</td>
<td>25.23</td>
<td>89.00</td>
<td>41</td>
</tr>
<tr>
<td>Other casual labor</td>
<td>77.87</td>
<td>30.51</td>
<td>77.14</td>
<td>829</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public works</td>
<td>73.03</td>
<td>32.62</td>
<td>80.00</td>
<td>13</td>
</tr>
<tr>
<td>Other casual labor</td>
<td>45.01</td>
<td>24.24</td>
<td>42.00</td>
<td>221</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Round 2</th>
<th>Mean</th>
<th>St.dev.</th>
<th>Median</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public works</td>
<td>94.03</td>
<td>23.89</td>
<td>100.00</td>
<td>119</td>
</tr>
<tr>
<td>Other casual labor</td>
<td>86.16</td>
<td>42.68</td>
<td>97.50</td>
<td>806</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public works</td>
<td>98.11</td>
<td>21.34</td>
<td>100.00</td>
<td>76</td>
</tr>
<tr>
<td>Other casual labor</td>
<td>97.44</td>
<td>39.83</td>
<td>100.00</td>
<td>577</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public works</td>
<td>86.81</td>
<td>26.58</td>
<td>100.00</td>
<td>43</td>
</tr>
<tr>
<td>Other casual labor</td>
<td>57.74</td>
<td>35.90</td>
<td>50.00</td>
<td>229</td>
</tr>
</tbody>
</table>

*Note: Missing identifiers entail that gender is unknown for some cases; hence, N is greater for “all” than for the sum of men and women.*
Leakage: Some comparisons with administrative data

<table>
<thead>
<tr>
<th></th>
<th>2008-09</th>
<th></th>
<th>2009-10</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Admin data</td>
<td>Survey as % of admin</td>
<td>Admin data</td>
<td>Survey as % of admin</td>
</tr>
<tr>
<td><strong>Employment Outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(million persondays)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persondays generated</td>
<td>99</td>
<td>79</td>
<td>114</td>
<td>98</td>
</tr>
<tr>
<td>New employment created (net of foregone employment)</td>
<td>---</td>
<td>45</td>
<td>45%</td>
<td>---</td>
</tr>
<tr>
<td><strong>Wage earnings (million Rs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total wages paid/owed</td>
<td>8396</td>
<td>6310</td>
<td>11087</td>
<td>8910</td>
</tr>
<tr>
<td>Total wages paid/received</td>
<td>8396</td>
<td>5310</td>
<td>11087</td>
<td>7850</td>
</tr>
<tr>
<td>Incremental wage gain (net of wages foregone)</td>
<td>---</td>
<td>3371</td>
<td>40%</td>
<td>---</td>
</tr>
<tr>
<td><strong>Memo:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% persondays foregone</td>
<td>43%</td>
<td></td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>% wages foregone</td>
<td>37%</td>
<td></td>
<td>40%</td>
<td></td>
</tr>
</tbody>
</table>

Note: net employment gain based on average foregone employment days of 43% and 42% in R1 and R2. Net wage gain based on average foregone income of 37% and 40% in R1 and R2.
Forgone income
Participation often comes at a cost

• There is bound to be some loss of income from other sources for at least some of those who take up public works employment.

• Given that the wage rate is so much higher than that for other work, some will naturally be attracted to NREGS for the wage gain over alternative work.

• Others will no doubt be unable to find other work, and for them the wage gain is also the net income gain from NREGS.

• The literature on the impacts on poverty of public works schemes has emphasized the importance of assessing the forgone income.
Estimating forgone employment and income

• Various approaches in the literature (time allocation model; matching estimators).
• Here we use individual self-assessments.
  – Individual knows a lot more than we do!
  – However, counterfactual questions are not easy to answer
• We ask counterfactual questions of participants:
  – How many days they expect to have worked and
  – What they would have earned if not for being in the program.
• High response rate; 98% by Round 2
• We may over-estimate forgone income due to double counting of forgone opportunities. Sensitivity tests.
## Forgone work opportunities identified by participants

<table>
<thead>
<tr>
<th>Forgone opportunities due to BREGS participation (% reporting) (Round 1)</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrate for work</td>
<td>13.50</td>
<td>2.13</td>
</tr>
<tr>
<td>Find some other work locally:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual work (other public works)</td>
<td>0.23</td>
<td>0.64</td>
</tr>
<tr>
<td>Casual work (ag)</td>
<td>20.25</td>
<td>25.32</td>
</tr>
<tr>
<td>Casual work (non-ag)</td>
<td>21.75</td>
<td>5.23</td>
</tr>
<tr>
<td>Search for work where possible</td>
<td>26.00</td>
<td>10.72</td>
</tr>
<tr>
<td>Work on own land or house</td>
<td>9.80</td>
<td>35.72</td>
</tr>
<tr>
<td>Remain unemployed</td>
<td>21.59</td>
<td>22.31</td>
</tr>
<tr>
<td>Other</td>
<td>0.37</td>
<td>0.05</td>
</tr>
</tbody>
</table>
Gross vs. net gain in employment

Round 1
• 79 million person days of employment.
• 43% mean forgone employment in R1.

Round 2
• 98 million person days of employment provided, but 42% days had to be given up.

Gender: Slightly higher forgone employment for men than women
Two alternatives to NREGS work

• In R1, 39% of those who worked on PW had zero forgone income (42% in R2).
• The rest reported that they felt they would have been working otherwise.
• Mean ratio of forgone income to PW wages is 0.37 in R1, rising to 0.39 in R2. The corresponding medians are 0.36 and 0.31.

There is forgone income, but it varies considerably between workers, which is not surprising.
Impacts on poverty

Bringing these elements together
Impact relative to “No-BREGS”

• The post-BREGS distribution of consumption is that observed in the data
• The pre-BREGS distribution is derived from this by subtracting the net gains from BREGS earnings, as given by gross wages less the imputed forgone income.
• Ignoring assets and savings
More formally

• Actual (observed) post-BREGS poverty measure:
  \[ P(y_1, \ldots, y_n; z) = P(y; z) \]

• Counterfactual poverty measure in the absence of BREGS:
  \[ P(y - w + f; z) \]
  where \( w = n \)-vector of actual wage earnings from BREGS
  \( f = n \)-vector of forgone incomes due to taking up BREGS work

• Impact on poverty =
  \[ P(y; z) - P(y - w + f; z) \]
About 1% point reduction in poverty due to the scheme

- A 1% point reduction in the poverty rate at a poverty line of slightly more than 5,000 Rupees per person per year.
- Amongst PW participants alone, the impact is higher, with a peak reduction in the poverty rate of 3% points, also at a poverty line of 5,000 Rupees.
NREGS has a much larger potential impact on poverty in Bihar

- **What is the potential impact under ideal conditions?**
  - 100 days of work per household who wants work at the stipulated minimum wage rate for the scheme
  - Only fully unemployed people join, i.e., no forgone income
  - Ignoring assets, savings and spillover effects
- This probably gives an under-estimate

![Graph showing difference in cdf of consumption before/after full potential NREG (no forgone income)](image)

12% point reduction in poverty rate
Rationing accounts for large share of performance gap

• To estimate impact in the absence of rationing we:
  – Scale up days of work to those desired, up to 100 days per h’hold with extra days valued at their mean net wage.
  – Give the median net earnings to those who wanted work but did not get any.

• Then we get a poverty impact of 4-5% points.
Comparisons with other states

Using 2009/10 NSS
A puzzle about NREGS in India as a whole

- Participation rates on NREGS across states of India are only weakly correlated with poverty rates across states.

- Why?
Poorer states of India do have higher demand for work on NREGS

- Poorer states have a higher % of h’holds who want work on NREGS
- “Demand”=actual employment + those who say they want work but could not get it.
- Though here too Bihar is an outlier, with demand for NREGS 0.14 below the regression line (t=-2.58).
Rationing in poorer states is the reason

• Greater rationing—unmet demand for work on the scheme—in some of the poorest states.
• Highest rationing in Bihar, but also high in Jharkhand and Orissa.
• Low levels in TN, HP, Rajasthan and Kerala

But low levels of rationing elsewhere, suggesting that the scheme is working better
Could access to the scheme be biased against the poor within states?

• If so then poor states will tend to have more rationing because they have more poor.

• However, this is not the reason....
Poor households are less likely to be rationed within states

Participation rate \((P)\)

Rationing rate \((R)\) \(P_i = (1 - R_i)D_i\)

So it is something special about poor states of India that explains the rationing. What might that be?
Why so much rationing? How can it be reduced?

We consider three possible explanations for rationing in poor states: (i) awareness; (ii) administrative capacity; (iii) corruption
1. Lack of awareness of their rights amongst workers

- Our survey suggests that awareness of the right to work is low, esp., women.
  - 95% of men and 73% of women had heard about the program
  - But most were unaware of their rights and entitlements under NREGA. Low level of understanding about how to get work.
- Yes they still say they want work, but they don’t realize they can demand work, and should get unemployment benefit if it is not provided.
- But why are they so unaware? History of subjugation/disenfranchisement, premised on illiteracy?
An awareness intervention
**Awareness can be influenced**

- **BREGS: the movie.** A RCT using a movie with fictional characters, tailored to Bihar’s specific context.
  - Shown in 40 randomly sampled villages in mid February and mid March 2010. Shown twice in each of two separate locations. Shown in common areas, such as an open ground, school building, or community hall.

- Significant effect on awareness of the existence of NREG and knowledge about the program.

- Also positive impacts (both genders) on perceptions that one can get work on NREGS when one demands it, that NREGS increased employment and lowered migration.

- But no signs (yet) of significant impacts on actual employment on the scheme.
2. Low administrative capacity in poor states

- State governments must cover a share of the skilled labor (admin) cost.
- Supply side is slow to respond.
  - Low levels of participation; few gram sabhas.
  - Lags in execution; intermittent closures
  - Poor flow of funds accounting
  - Wages paid in cash not through POs
  - High costs of organizing projects, workers, reporting
  - Poor supervision
  - Lack of transparency
- A scheme such as NREGS is likely to be harder to implement in poor states.
Meeting all of the demand for work may not be an equilibrium at local level

- State chooses level of employment to minimize:
  \[ cE + p(D - E) \text{ s.t. } E < D \]
  where \( p(.) \) penalizes unmet demand; \( p \) is strictly increasing and convex.

- Sufficiently high unit cost:
  \[ c > p[f(c)]/f(c) \]

- Solution takes the form:
  \[ E = D - f(c) \]
  where \( f(c) > 0 \) and \( f''(c) > 0 \).
This is what we observe across states

Though Bihar is still low!
Lowering administrative cost in poor states will reduce rationing of work

Demand for work

Work provided

\[ f(c_2) \quad f(c_1) \]

Slope = 1

\[ c_2 < c_1 \]
3. Corruption?

- Surely corrupt local officials will have an incentive to eliminate the rationing by starting more projects?
- Not if their own personal gain from doing so is constrained by the design of the scheme.
- Corruption requires cooperation between a set of stakeholders (officials and workers).
- Marginal cost of corruption may rise steeply at higher levels of disbursement given checks and balances built into the design.
- Very high MC when local officials would need to extend their network of collusion beyond the “comfort zone” of those they trust.
A simple model of rationing on NREGS

- Local officials maximize:
  \[ R(E) - C(E) \text{ s.t. } E < D(w) \]
  - \( R(E) \) = officials’ own revenue at employment \( E \); \( C(E) \) = cost of corruption; \( D(w) \) = supply of labor to NREGS at wage \( w \)
  - Assume \( R''(E) < C''(E) \)

- There will be rationing in equilibrium if \( E^* < D(w) \), where \( R'(E^*) = C'(E^*) \).
Increasing the marginal cost of corruption lowers employment on the scheme

The better way to reduce corruption is to make it impossible for local official to ration NREGS jobs: Public Awareness + social monitoring will make this model irrelevant.
Main messages
NREGS in Bihar is falling well short of its potential impact on poverty

- Potential 12% point reduction in poverty in Bihar vs. actual impact of 1% point.
- Some of this gap is hard to avoid, esp., forgone income
- But also many discrepancies between “theoretical ideal” and practice
  - Rationing is common; 2/3 of those who want work do not get it
  - While the rationing process is “pro-poor” overall some socially/politically excluded groups have poor access
  - Received wages lower than stipulated wages
  - Worksites often lack facilities
  - Processes weak
Performance issues are limiting the potential benefits

• Rationing makes it unlikely that there will be large insurance and empowerment benefits.
• Shocks do not predict participation.
• Lack of awareness of rights under NREGS also makes it unlikely that there would be large impacts on empowerment.
• No sign of impacts on participation in village decisions or that respect in the community improved.
Bihar is not typical of NREGS in India

• There is a collection of some of the poorest states (Bihar, Orissa and Jharkhand) where rationing is substantial.

• But also a number of states where this is not a problem, suggesting that the scheme is likely to be working better in reducing poverty and attaining its insurance and empowerment potential.

• Harder to reduce poverty in poorer states.
What to do? Two fronts jointly

1. Better public administration
   • Many ways to improve/tighten up processes at all stages
   • These require addressing the shortage of NREGS professionals in poor states, all the way to local level

2. Better civil society engagement
   • As long as local agents can ration work, small reforms will have little bite, and may have undesirable effects (higher MC of corruption)
   • Better to use enhanced administrative capabilities to promote local public awareness of the rights and rules of the scheme, and local monitoring through social audits, with recourse mechanisms.