Employment Generation, Labour Migration and MGNREGP Intervention: Evidences from a Village Level Study[§]

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Abstract

Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGP) was launched by the Government of India to serve many objectives including empowerment of women and marginalized communities of the society and reducing the ever-increasing flow of rural labour to urban centres. This paper has looked into the extent of participation of male and female workers, marginalized sections of the society and workers of different age groups in MGNREGP, by conducting a study in Markabbinahalli village of Bijapur district in Karnataka, characterized with distinct migration pattern, during the agricultural year 2012-13. Both primary and secondary data were used in the study. Analytical tools used were z-test, t-test, Fisher's Exact Probability Test and one way ANOVA. The study has found no bias of cast, gender and age in providing employment to the participants of programme. The female workers received gainful employment in the programme. The higher non-farm wage rates constrained MGNREGP in reducing migration of workers to urban centres in the study village. The programme empowered the women workers, at least on a modest scale.

Key words: MGNREGP, labour migration, women empowerment, employment generation

JEL Classification: Q12, Q18

Introduction

Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGP) is the flagship programme of Government of India with a significant intervention for livelihood security in the rural areas of the country by providing 100 days of wage employment to all the households whose adult members are ready to do manual labour work at wage rates notified by the Government. Its other objectives include: creation of demand-driven durable assets for rural areas, strengthening of natural resource base of rural poor, reduction in rural – urban migration and aiding the empowerment of the marginalized sections of the society, especially women, Scheduled Castes (SCs) and Scheduled Tribes (STs). The expected programme outcomes include: strengthening grass-root process of democracy and infusing transparency and accountability in the governance. However, empowerment of marginalized communities and women assumes major significance in achieving other objectives of the programme (Mann and Pande, 2012; Anonymous, 2012). Since women comprise 48 per cent

and marginalized communities make up about 24 per cent of the country's population, achievement of programme objectives and realization of programme outcomes remain a dream without empowerment of women and marginalized communities.

With population of India crossing 1 billion in the previous decade and nearly 70 per cent of the population still living in villages, creation of basic infrastructure in the rural areas assumes great importance. Further, it has been established that lack of basic amenities in rural areas leads to migration of people to urban centres in need of necessities. This leads to a rise in urban population which exerts tremendous pressure on the already congested cities (Todaro and Smith, 2011). The Census 2001[1] data shows that, Maharashtra topped the list of inter-state migration with 2.3 million net in-migrants during the past one decade, followed by Delhi (1.7 million), Gujarat (0.68 million) and Haryana (0.67 million). Uttar Pradesh (-2.6 million) and Bihar (-1.7 million) were the two states with largest number of net out-migrants. This clearly shows that states with highest net emigration were from BOMARU (Bihar, Odisha, Madhya Pradesh, Rajasthan and Uttar Pradesh) and BIMARU (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) groups of states.

As flow of migration increases with every passing year, reducing migration of workers from rural areas to urban centres assumes great importance. At this juncture, MGNREGP is conceived to have pan India effect in reducing migration to urban centres.

The impact of MGNREGP in reducing migration is, however, often disputed. Kamath *et al.* (2008) have reported that the percentage of people ready to migrate even if MGNREGP is implemented on a large scale was the highest in the Raichur district (11.3 %), followed by Gulbarga district (10.6 %) in Karnataka, and Adilabad (8.3 %) and Anantapur (1%) district in Andhra Pradesh. The results of a study conducted by the Centre for Science and Environment (CSE, 2008) show that MGNREGP was successful in reducing migration in the Siddhi district of Madhya Pradesh, while the programme could not reduce migration in the Nuapada district of Odisha. The effects of MGNREGP are spatial as revealed by many studies. However, those findings cannot be generalized to other areas without proper statistical analysis. This necessitated the present study to statistically prove the hypothesis that MGNREGP helps in reducing rural-urban migration.

Currently, migration is high in many villages across whole of India, especially in the dry land areas and women, children and elderly people constitute the majority of population staying back in such villages. This prompted the researchers to hypothesize that women and elderly people form the majority in the MGNREGP workforce. However, such a hypothesis was countered by the findings of the studies conducted by the Indian Institute of Management, Calcutta (IIM-C, 2009) and the Indian Institute of Technology, Madras (IIT-M, 2009) which showed that young workers constituted more than half of the MGNREGP participants. However, participation based on head count does not provide a true picture of their participation, because, though the number of young workers may be more, days of employment received by them may be less. Hence, further evidences are required to arrive at a firm conclusion regarding the age group of MGNREGP participants.

With this background, the present study was taken up with the following objectives:

•   Study the rate of participation of female and male workers under MGNREGP.

•   Analyse the employment gained by marginalized sections of the society by participation in MGNREGP.

•   Study the impact of MGNREGP on rural-urban migration.

•   Analyse participation across different age groups in MGNREGP.

Data and Methodology

This study was taken up, with financial support from ICRISAT, Hyderabad, in Markabbinahalli village of Bijapur district in Karnataka, having rainfed agriculture with no dug-well or bore-well due to salinity of groundwater and an average annual rainfall of 625 mm spread over 41 rainy days. VDSA study has been undertaken in this village by ICRISAT, Hyderabad. The village has a population of 2537 people with a sex ratio

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[1] Data sourced from web-link http://censusindia.gov.in/Census_And_You/migrations.aspx on 11 May, 2015.

of 907 females per 1000 males and 527 children as on 31st December 2010 (Desai *et al.,* 2012). Out of 392 households present in the village, 108 are landless, 41 are marginal, 87 are small, 84 are medium and 72 are large households, according to the VDSA farm classification system[2].

The village economy is characterised by the distinct migration pattern to nearby towns such as Bijapur and Devarhippargi and to distant places such as Bengaluru and Solapur wherein migrants get employment in the construction sector at very high wage rates (₹ 500 per day). The migration rate is also high because of non-usable groundwater in the village and 28 per cent of the households being landless. According to Murthy *et al.* (2014), for agricultural year 2012-13, the village economy of Markabbinahalli received remittances from migrant workers to the tune of ₹ 52 lakhs which is thirteen-times the labour income earned under MGNREGP in the village.

The primary data, for the agricultural year 2012-13, were collected from 30 participants and 30 non-participants of MGNREGP from the study village using pre-tested, well-structured schedules. Detailed secondary data were collected from web link http://nrega.nic.in/netnrega for the financial years 2011-12 to 2013-14.

Analytical Tools

To analyse the data, z-test, t-test, F-test, Fisher's Exact Probability Test and one way ANOVA were used (Gupta, 2011). The z-test was applied to test the hypothesis of no difference in average days of employment received by male and female participants of MGNREGP. Following formula was used to calculate the test statistics value:

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\dfrac{\sigma_{p1}^2}{n_1} + \dfrac{\sigma_{p2}^2}{n_2}}}$$

where, $\bar{X}_1$ and $\bar{X}_2$ are the respective means of employment days for male and female participants of

MGNREGP and σ_{p1}^2 and σ_{p2}^2 are the two known variances for two samples of n_1 and n_2 size, respectively.

If p-value[3] calculated for test statistics under the assumption that null hypothesis is true, turns out to be less than the chosen level of significance, then, it would imply that null hypothesis cannot be accepted at the chosen level of significance. This means there exists significant difference with respect to the number of days of employment received between male and female participants of MGNREGP.

To test the hypothesis of no difference between workers belonging to SC and others category with respect to the days of employment received under MGNREGP, t-test was used. Since application of t-test requires testing for assumption of equality of variance between the two groups, F-test was used to check this assumption. If S_1^2 is a larger estimate and S_2^2 is a smaller estimate of variance then test statistics F ratio can be calculated as:

$$F = \frac{S_1^2}{S_2^2}$$

The decision rule to determine the significance of calculated value would be the same as stated for z-test. If F-test statistics calculated turns out to be significant, then t-test with equality of variance assumption cannot be applied. If, opposite happens to be true, then following formula can be used for calculation of t-test statistic:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S} * \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

where, S is the combined standard deviation (or pooled standard deviation) and is calculated as follows:

$$S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$ with two independent

random samples of size n_1 and n_2 for SC and others category, respectively, with means $\bar{X}_1$ and and $\bar{X}_2$ standard deviations S_1 and S_2.

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[2] < 0.1 ha=Landless; 0.1-<1 ha=Marginal; 1-<2 ha=Small; 2-4 ha=Medium; >4 ha=Large.

[3] The p-value is 'the probability of observing a test statistic at least as large as the one calculated assuming the null hypothesis is true'.

Similarly, to check for significance of test statistics, the decision rule stated in the case of z-test, would be applicable.

To test the impact of MGNREGP on migration of rural workers to urban areas, Fisher's exact probability test using R version software 3.1.2 (R Core Team, 2014) was applied. This test is similar to the Chi-square test, but is used when cell frequency in any one of the cells is below 5. The test statistics for the Fisher's exact probability test is given by:

$$p = \frac{(A+B)!(C+D)!(A+C)!(B+D)!}{N!A!B!\ C!D!}$$

where, A, B, C and D are cell frequencies and N is the total of all cell frequencies. If p-value is less than or equal to the chosen level of significance, then null hypothesis can be rejected at the chosen level of significance for one tail test. The rejection of null hypothesis implies that participants and non-participants of MGNREGP differ significantly in the proportion of migration and non-migration attributed to them.

To calculate sample estimate of odds ratio (McHugh, 2009), following formula is used:

$$Odds\ ratio = \frac{Odds\ 1}{Odds\ 2}$$

where,

$$Odds\ 1 = \frac{Probability\ of\ migration\ of\ MGNREGP\ worker}{Probability\ of\ non\text{-}migration\ of\ non\text{-}MGNREGP\ worker}$$

$$Odds\ 2 = \frac{Probability\ of\ migration\ of\ non\text{-}MGNREGP\ worker}{Probability\ of\ non\text{-}migration\ of\ non\text{-}MGNREGP\ worker}$$

Each Odds shows the probability of migration versus non-migration of a particular type of worker. Odds ratio shows as to how many times a MGNREGP worker is likely to migrate than not migrate compared to a non-MGNREGP worker.

To test the significance of difference among different age groups of workers, one-way/single-factor Analysis of Variance (ANOVA) was used. The ANOVA method also utilizes the mechanism of the F-test for testing for the significance of difference between the two variances, but the test is so designed that the

Table 1. Difference between male and female workers participation rate in MGNREGP works in Markabbinahalli, Karnataka, for financial years 2011-12 to 2013-14

Particulars	Male worker	Female worker
Average employment (No. of days)*	39.44	37.75
Known variance	429.93	320.52
Observations (No.)	100	87
Hypothesized mean difference	0	
Z		0.599
p (Z<=z) one-tail		0.274
z Critical one-tail		1.645
p (Z<=z) two-tail		0.549
z Critical two-tail		1.959

*These figures are not per annum values but are averages per worker for three years.

variances being compared are different only if the means under consideration are not homogeneous. In this way, significant values indicate that the means are significantly different from one another.

Results and Discussion

The results of the analysis relating to first objective, viz. participation rate of male and female workers in MGNREGP, are presented in Table 1. From Table 1, it can be observed that the average number of employment days per year received by male and female participants were 13.13 days and 12.58 days, respectively. It can be observed that one tail p-value (0.279) is more than five per cent level of significance. Thus, the results of z-test have shown that there was no significant difference between the days of employment received by male and female participants of MGNREGP during the financial years 2011-12 to 2013-14 in Markabbinahalli village. This may be due to the fact that female labourers received higher wage rate under MGNREGP (₹ 174 per day) compared to agriculture labour work (₹ 150 per day) or for working as household maids (₹ 400-600 per month[4]). Table 1 also reveals that female to male employment ratio was 870[5] female per 1000 male workers employed.

The results of analysis relating to the second objective, viz. employment gained by marginalized sections of the society are presented in Table 2, which

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[4] It works out to ₹ 160 per day assuming that the maids work for an hour in a house.

Table 2. Difference in employment of workers and households belonging to SC and other categories in MGNREGP works in Markabbinahalli, Karnataka, for financial years 2011-12 to 2013-14

Particulars	Workers		Households	
	SC	Other	Other	SC
Average employment per worker (No. of days)*	42.44	38.07	118.60	176.83
Variance	414.01	372.11	7962.79	9174.57
Observations (No.)	25	162	52	6
F-test				
Degree of freedom (Df)	24	161	51	5
F		1.11		0.87
p (F<=f) one-tail		0.34		0.34
F Critical one-tail		1.59		0.42
t-test with equality of variance assumption				
Pooled variance		377.55		8070.99
Hypothesized mean difference		0		0
Degree of freedom (Df)		185		56
t stat		1.05		-1.50
p (T<=t) one-tail		0.15		0.07
t Critical one-tail		1.65		1.67
p (T<=t) two-tail		0.30		0.14

*These figures are not per annum values but are averages per worker and per household for three years.

reveals that the average number of days of employment received per year by households belonging to SC and other categories was around 59 days and 39 days, respectively. In case of workers belonging to SC and other category, the number of days of employment received per year on per worker basis was around 14 days and 13 days, respectively. On the whole, for all categories, the average number of days of employment received by a worker and a household per year under MGNREGP was 13 days and 42 days, respectively.

To check the validity of assumption that variance of the two groups of MGNREGP participants, viz. SC workers and other groups, F-test was conducted, before applying the t-test. Since one-tail P value (0.34) obtained for F-test statistic was greater than the significance level of 0.05, it was concluded that equality of variance prevailed for both the groups. The t-test analysis conducted with the assumption of equality of variance revealed that at five per cent level of significance, it can be inferred based on one-tail p-values (0.15 and 0.07) obtained that there was no significant difference in employment (days) received by workers and households belonging to two categories, viz. SC and other for the financial years 2011-12 to 2013-14 in Markabbinahalli village.

The lack of awareness about MGNREGP and higher income earned through migration (₹ 500/ person/ day) had affected the participation of households belonging to SC category in MGNREGP. This is evident from the fact that out of 187 workers who participated in MGNREGP in three years (2011-12 to 2013-14), 25 workers belonged to SC category which constituted only 13.3 per cent of work participation by SC category workers compared to 13.26 per cent of households belonging to SC category in Markabbinahalli village.

From Figure 1, it can be inferred that out of 58 households that participated in MGNREGP works in Markabbinahalli village, only two households had completed 100 days of guaranteed employment which constituted only 3.45 per cent of households that participated in MGNREGP. However, no household belonging to SC category had completed 100 days of guaranteed employment.
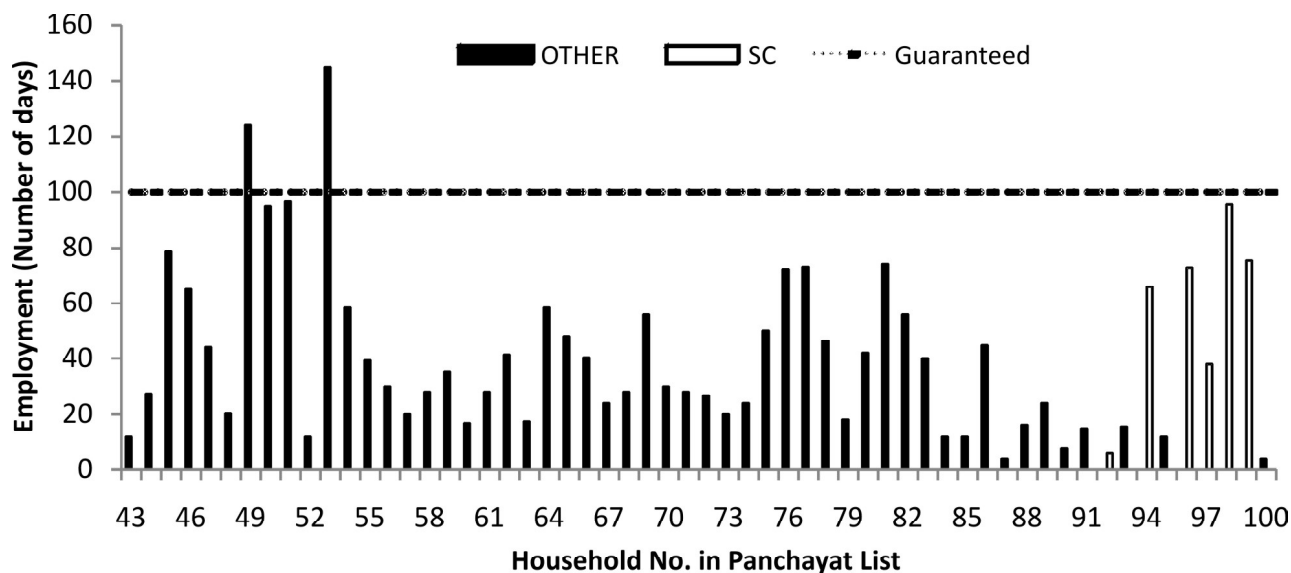
Figure 1. Average employment (number of days) per annum received by households under MGNREGS (from April 2011 to March 2014)

Table 3. Migration and participation of workers in MGNREGP in Markabbinahalli village (Agricultural year 2012-13)

Participation in MGNREGP	Migration Status		Total
	Migrants	Non-migrants	
Participants	8 (67)	4 (33)	12
Non-participants	17 (35)	31 (65)	48
Total	25 (41.67)	35 (58.33)	60

Notes: 1. Figures within the parentheses indicate percentage of row total.

2. Of the total 30 MGNREGP participants interviewed (selected from the list of MGNREGP participants available in the MGNREGA website), 18 participants did not confirm their participation in MGNREGP and hence were clubbed under Non-participants.

To study the impact of MGNREGP on rural-urban migration, Fisher's exact probability test using R version software was applied to 2×2 contingency table (Table 3). Here, null hypothesis tested was that workers participating and not participating in MGNREGP had equal probability of migration from the Markabbinahalli village during the agricultural year 2012-13.

Based on the values presented in Check Box 1, it can be said that since p-value (0.09894) is more than 0.05, i.e. chosen level of significance, null hypothesis can be accepted at five per cent level of significance. Since hypothesized odd ratio of one lies in the confidence interval, null hypothesis is accepted at five

per cent level. From the estimated Odds ratio for sample, it can be interpreted that a worker participating in MGNREGP is 3.5-times more likely to migrate than not migrate compared to a worker not participating in MGNREGP. Since the null hypothesis is accepted at five per cent level of significance, estimated odds ratio of 3.6 is not significantly different from 1. Hence, there is no significant difference in the probability of migration of a worker participating and not participating in MGNREGP. Therefore, it can be concluded that MGNREGP had no effect on the migration of rural workers.

To study the participation of workers across different age groups in MGNREGP, participation rate

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Check Box 1

Migration and participation of workers in MGNRGEGP in Markabbinahalli village
(Agricultural year 2012-13)

Fisher's Exact Test for Count Data

p-value = 0.09894

Alternative hypothesis: True odds ratio is not equal to 1

95 per cent confidence interval: [0.8117057,   18.6531655]

Sample estimates: odds ratio 3.564552

Table 4. Difference between aged and young workers participation during financial years 2011-12 to 2013-14

Summary of work participation (number of days) by workers of different age groups

Age group	Count	Sum	Average	Variance	SD	CV (%)
18-35 years	58	3553	61.26	2727.91	52.23	85.26
35-50 years	58	2581	44.50	2004.25	44.77	100.60
50 years and above	58	1094	18.86	969.95	31.14	165.11

Results of one-way ANOVA

Source of variation	SS	df	MS	F	p-value	F crit
Between groups	52888.70	2	26444.35	13.91	2.5×10^{-06}	3.05
Within groups	325020.51	171	1900.70			
Total	377909.22	173				

*These figures are not per annum values but are averages per worker for three years.

was measured by the days of employment per worker in the programme. To test the difference in participation rate among the three different age groups, single-factor ANOVA was used and the results are presented in Table 4. It can be seen from Table 4 that the average number of days of employment availed by the workers, in three-year period from 2011-12 to 2013-14, was the highest for young age group (61.26 days), followed by middle age group (44.5 days) and elderly age group (18.86 days).

The coefficient of variation was the least for the young age group, followed by middle age group and was the least for the elderly age group, which shows that these groups are more, less and the least consistent across the households with respect to participation in MGNREGP, respectively. Since *p*-value for F statistic from one-way ANOVA obtained is less than 0.05, i.e. the chosen level of significance, null hypothesis cannot be accepted at five per cent level of significance. Hence, it can be said that participation rate among the three

different age groups was not significantly different. This result allays the fear that due to migration of young workers, only the elderly people, who stay back in the villages, would participate in MGNREGP in large numbers.

Conclusions

The study has revealed that (a) women got gainful employment under MGNREGP as the wage rate provided under the programme was higher compared to farm wages for women and house-maid wages, (b) there was no gender, caste and age bias in providing employment to workers and households under MGNREGP, and (c) the programme had no effect on migration of rural workers to urban centres.

To sum-up, MGNREGP has been successful in empowering women and marginalized sections of the society on a modest scale. However, due to higher wage rates prevailing in the non-farm sector compared to

MGNREGP, rural workforce earns higher income by migration to city centres.

Acknowledgements

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