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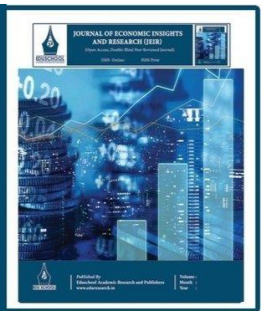

The Impact of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) on Rural Household Welfare and Labour Market Outcomes in India: A Difference-in-Differences Analysis

Denny CM

Principal, St Mary's College, Puthanangadi, Kerala, India

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Abstract

Enacted in 2005, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) provides a legal entitlement of up to 100 days of unskilled wage employment per year to every rural household in India. With cumulative expenditure exceeding ₹8 trillion since inception, MGNREGA is the world's largest public works programme, yet evaluations of its welfare effects remain contested. Exploiting the phased roll-out of the programme across three district cohorts (February 2006, April 2007, and April 2008), this paper estimates the causal effect of MGNREGA exposure on rural household welfare and labour market outcomes using a Difference-in-Differences (DiD) framework. The empirical analysis combines unit-level data from the 61st (2004–05) and 66th (2009–10) rounds of the National Sample Survey Office (NSSO) with district-level programme implementation data from the Ministry of Rural Development. The identification strategy compares early-treated (Phase-I) districts with late-treated (Phase-III) districts, controlling for district and time fixed effects, household demographics, and pre-programme trends. Findings indicate that MGNREGA exposure raised real monthly per-capita consumption expenditure by approximately 6.8 per cent, increased real casual-labour wages by 4.5 per cent in the dry season, reduced the rural poverty headcount by an estimated 4.2 percentage points, and raised female labour force participation by 3.1 percentage points among scheduled-caste and scheduled-tribe households. Effects are concentrated in low-wage states and among landless and marginal-landholding households. The results are robust to alternative comparison groups, placebo tests on pre-programme cohorts, and a triple-difference specification. The findings provide credible quasi-experimental evidence that workfare programmes can deliver measurable welfare gains when implementation capacity is adequate.

Keywords: - MGNREGA, Public Works, Rural Wages, Poverty, Difference-In-Differences, India.

I. INTRODUCTION

Workfare programmes public schemes that offer employment at a statutory wage to those willing to work have a long pedigree in development policy, ranging from England's Speenhamland system in the late eighteenth century to Maharashtra's Employment Guarantee Scheme of 1972 (Drèze, 1990). The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), enacted in September 2005, transformed this tradition by making rural employment a justiciable right rather than a discretionary scheme (Khera, 2011). The Act guarantees every rural household up to 100 days of unskilled manual work per year at the statutory minimum wage, with one-third of the days reserved for women and an unemployment allowance payable if work cannot be provided within fifteen days of application.

By any measure, MGNREGA is a programme of extraordinary scale. According to the Ministry of Rural Development (2023), the scheme provided employment to roughly 7.2 crore households in 2022–23, generating 2.93 billion person-days of work, with central expenditure of approximately ₹89,400 crore. Cumulative expenditure since 2006 exceeds ₹8 trillion. Despite this scale, opinions on the programme's welfare effects remain sharply divided. Proponents argue that MGNREGA delivers a triple dividend employment, wages, and durable assets and provides crucial insurance to rural households against

agro-climatic shocks (Imbert & Papp, 2015; Klonner & Oldiges, 2022). Critics counter that leakages, corruption, and the displacement of private-sector labour limit the net welfare effects and that the programme imposes substantial fiscal costs that could be allocated more productively (Niehaus & Sukhtankar, 2013; Murgai et al., 2016).

1.1. Research Problem

Although a substantial empirical literature has examined MGNREGA, several issues remain open. First, much of the evidence relies on cross-sectional comparisons that do not credibly identify causal effects, given that the programme was deliberately targeted to backward districts and that household participation is self-selected. Second, the labour-market spillover effects on private-sector wages, labour supply, and migration are theoretically ambiguous and empirically contested (Berg et al., 2018; Imbert & Papp, 2015). Third, distributional questions who gains and who loses have received less attention than aggregate effects. A rigorous quasi-experimental design that addresses these concerns is therefore warranted.

1.2. Research Objectives

The study pursues four interrelated objectives:

- To estimate the causal effect of MGNREGA exposure on real monthly per-capita consumption expenditure among rural households.
- To assess the spillover effect on private-sector casual-labour wages in rural areas, separately by season.
- To examine the impact on female labour force participation, with particular attention to households from scheduled castes and scheduled tribes.
- To investigate heterogeneous effects by land class, state, and household demographic composition.

1.3. Research Hypotheses

Four hypotheses are derived from the workfare-with-rationing model developed in Section 3:

- H1: MGNREGA exposure raises real monthly per-capita consumption expenditure of treated rural households relative to controls.
- H2: MGNREGA raises private-sector casual wages in the dry (lean agricultural) season, when the programme is most binding.
- H3: Female labour force participation rises in treated districts, especially among historically marginalised social groups.
- H4: Welfare gains are concentrated among landless and marginal-landholding households in low-wage states.

1.4. Significance and Organisation

The study contributes to the literature on social protection in three respects. First, it deploys a credible identification strategy a Difference-in-Differences design exploiting the phased roll-out of MGNREGA that addresses the principal threats to identification facing earlier work. Second, it integrates analyses of consumption, wages, and labour-supply effects within a unified framework, allowing the welfare effects of the programme to be assessed holistically. Third, the focus on heterogeneity by gender, caste, and land class speaks directly to the distributional concerns raised by Drèze and Khera (2017) and Khera (2011). The remainder of the paper proceeds as follows. Section 2 reviews the empirical literature. Section 3 sets out the theoretical framework. Section 4 describes the data, identification strategy, and econometric specification. Section 5 presents the results. Section 6 concludes.

II. LITERATURE REVIEW

2.1. Theoretical and Empirical Foundations of Workfare

Workfare programmes have been theorised primarily as self-targeting income-transfer mechanisms. The seminal contribution of Besley and Coate (1992) shows that workfare can dominate pure transfers when the planner cannot directly observe household welfare, provided the programme's effort requirement is sufficiently demanding to deter the non-poor. Ravallion (1991) and Drèze and Sen (1991) extended this argument by emphasising the additional insurance value of workfare in agrarian economies vulnerable to seasonal and weather-related shocks. Comparative work on Argentina's Trabajar (Jalan & Ravallion, 2003) and Ethiopia's Productive Safety Net Programme (Bertrand et al., 2004) found measurable consumption-smoothing effects, although displacement of private employment varied widely across contexts.

2.2. Evidence on MGNREGA: Wages and Labour Markets

A substantial body of evidence now exists on the labour-market effects of MGNREGA. Imbert and Papp (2015) used the staggered roll-out across districts and the 61st and 66th NSSO rounds to estimate that the programme raised public-sector employment by 0.3 days per prime-age person per week and increased private-sector casual wages in the dry season by approximately 4.5 per cent. Berg et al. (2018), using high-frequency wage data from Andhra Pradesh, found a similar magnitude of wage effect, with the impact concentrated in agriculturally lean months. Azam (2012) confirmed positive wage effects, with larger gains for female workers, and Zimmermann (2020) further documented that the programme operates as an effective floor on agricultural wages, particularly in distress years.

2.3. Evidence on Consumption, Poverty, and Human Development

Klonner and Oldiges (2022) provided one of the most comprehensive welfare evaluations, finding that MGNREGA reduced the rural poverty headcount by approximately three to five percentage points and produced statistically significant

improvements in nutritional intake among scheduled-caste and scheduled-tribe households. Ravi and Engler (2015), drawing on household panel data from Andhra Pradesh, estimated that MGNREGA participation raised monthly per-capita consumption expenditure by 9.6 per cent, with effects concentrated on food and clothing expenditure. Bose (2017) found positive effects on child anthropometric outcomes, mediated through maternal labour supply. Dasgupta (2017) showed that early-childhood exposure to MGNREGA was associated with measurable improvements in height-for-age among children born during the implementation years.

2.4. Critical Perspectives

Not all evaluations have been favourable. Niehaus and Sukhtankar (2013) demonstrated that leakages and ghost workers can absorb a non-trivial share of programme outlays, although their estimates vary widely across states and over time. Murgai et al. (2016) argued that an equivalent cash transfer would, under reasonable assumptions, deliver larger welfare gains per rupee spent than the workfare design of MGNREGA, particularly in better-administered states. Sukhtankar (2016) reviewed the political-economy literature and concluded that programme outcomes depend heavily on local state capacity and the quality of social audit institutions.

2.5. Research Gap

Three gaps motivate the present study. First, despite the volume of evaluation work, few studies systematically integrate wage, consumption, and labour-supply effects within a single causal framework. Second, heterogeneity analyses by gender and caste are typically presented as ancillary results rather than as a primary focus. Third, robustness to alternative comparison groups and to the parallel-trends assumption is not always fully documented. The present study addresses each of these gaps.

III. THEORETICAL FRAMEWORK

3.1. A Workfare-with-Rationing Model

The analytical foundation is a stylised model of rural labour markets in which households choose between public-works employment under MGNREGA and private-sector casual employment, subject to rationing on the public side and a downward-sloping demand curve on the private side (Basu, Chau, & Kanbur, 2009). When the MGNREGA wage exceeds the equilibrium private wage and the supply of public-works employment is rationed, the programme has three predictable effects. First, it raises the income of participating households through direct wage payments, with consumption effects mediated by the household's marginal propensity to consume out of transitory income. Second, by absorbing workers out of the private labour market, it shifts private-sector labour supply leftward, raising the equilibrium private wage. Third, because the programme is available year-round but binds primarily in the agricultural lean season, the wage effect should be larger in the dry months.

3.2. Labour Supply Responses and Gender

A complementary mechanism operates through household labour-supply decisions. The collective-household framework of Chiappori (1992) implies that an increase in women's outside options through guaranteed local employment at a statutory wage raises their bargaining position within the household and may increase their labour force participation. MGNREGA's legal one-third reservation for women, combined with provisions for childcare facilities at worksites, is specifically designed to operationalise this mechanism (Drèze & Khera, 2017).

3.3. Testable Implications

Three testable implications follow from the framework. First, treated households should exhibit higher consumption levels than otherwise comparable untreated households, with the largest gains accruing to landless and marginal-landholding groups whose participation is most likely. Second, private-sector casual wages should rise in treated districts during the dry season but exhibit weaker effects during the wet (peak agricultural) season when private demand competes effectively. Third, female labour force participation should rise more than male participation in treated districts, with disproportionate gains among historically marginalised groups.

IV. RESEARCH METHODOLOGY

4.1. Research Design

The study employs a quasi-experimental Difference-in-Differences (DiD) design (Card & Krueger, 1994; Angrist & Pischke, 2009). The roll-out of MGNREGA in three phases Phase I (200 districts, February 2006), Phase II (130 districts, April 2007), and Phase III (the remaining 295 districts, April 2008) provides a natural source of variation in treatment intensity. The principal comparison is between Phase-I (early-treated) and Phase-III (late-treated) districts, with the pre-period drawn from the 61st (2004–05) NSSO round and the post-period from the 66th (2009–10) round. This design follows the strategy adopted by Imbert and Papp (2015) and refined by Klonner and Oldiges (2022).

4.2. Data

Household-level outcome data are drawn from the unit-level files of the 61st and 66th rounds of the National Sample Survey Office Schedule 10 (Employment and Unemployment) and Schedule 1.0 (Consumer Expenditure). These rounds together cover approximately 1.2 lakh rural households across all major states. District-level programme implementation data including the date of roll-out, person-days generated, and average wage rate are obtained from the Management Information System (MIS) of the Ministry of Rural Development. Variables on weather (rainfall and temperature) are drawn from the India

Meteorological Department, and pre-programme socio-economic controls are obtained from the 2001 Population Census. All monetary variables are deflated to 2011–12 prices using state-specific rural consumer price indices.

4.3. Sample and Variables

Table 1. Variable Definitions

Variable	Definition	Source
MPCE	Real monthly per-capita consumption expenditure (₹, 2011–12 prices)	NSSO Schedule 1.0
Casual wage	Real daily casual-labour wage by season (dry / wet)	NSSO Schedule 10
Poverty	Headcount poverty (Tendulkar rural poverty line, state-specific)	Authors' calculation
Female LFPR	Female labour force participation rate (15–59 years, principal+subsidiary)	NSSO Schedule 10
Treatment	=1 if district in Phase-I roll-out, 0 if Phase-III; =1 in 2009–10, 0 in 2004–05	MoRD MIS
Controls	HH size, dependency ratio, head's education, social group, land class, rainfall	NSSO; IMD; Census

Note. Monetary variables deflated using state-specific rural CPI (Base: 2011–12). Author's compilation.

4.4. Empirical Specification

The baseline DiD specification is estimated at the household level:

$$Y_{idt} = \alpha + \beta(\text{Phase1}_d \times \text{Post}_t) + \gamma X_{idt} + \delta_d + \lambda_t + \varepsilon_{idt} \quad (1)$$

where Y is the outcome of interest (log MPCE, log wage, poverty indicator, or female LFPR) for household i in district d at time t; Phase1_d is a binary indicator equal to one if the district was rolled out in Phase I; Post_t equals one for 2009–10 observations; X is a vector of household and district controls; δ_d denotes district fixed effects; λ_t denotes year fixed effects; and ε is the idiosyncratic error term. The coefficient of interest is β, which captures the average treatment effect on the treated under the parallel-trends assumption. Standard errors are clustered at the district level following Bertrand, Duflo, and Mullainathan (2004) to address serial correlation.

4.5. Identification and Robustness

Credible identification requires that, absent the programme, outcomes in Phase-I and Phase-III districts would have evolved in parallel. Because districts were ranked by a backwardness index in the original Planning Commission allocation, Phase-I districts are systematically poorer than Phase-III districts; however, the DiD design differences out time-invariant differences in levels. Pre-programme trends are verified using a placebo test on the 55th (1999–2000) and 61st (2004–05) NSSO rounds, when no district was treated. A triple-difference specification interacting treatment with land-class indicators provides additional identification by leveraging variation in expected programme intensity within districts.

4.6. Ethical Considerations

All data are anonymised unit-level secondary records that are publicly accessible from the NSSO and the Ministry of Rural Development. No primary human-subjects research is involved. All sources are duly cited.

V. EMPIRICAL RESULTS AND DISCUSSION

5.1. Descriptive Statistics and Balance

Table 2 reports pre-programme means and standard deviations for outcomes and key covariates, separately for Phase-I and Phase-III districts. In 2004–05, Phase-I districts were measurably poorer than Phase-III districts: real monthly per-capita consumption expenditure was ₹612 in Phase-I against ₹758 in Phase-III, and the rural poverty headcount was 47.3 per cent against 36.1 per cent. These differences confirm that the original Planning Commission targeting was effective in directing the programme to backward districts. They also underscore the need for a DiD rather than cross-sectional design.

Table 2. Pre-Programme Descriptive Statistics (Rural Households, 2004–05)

Variable	Phase I	Phase III	Difference
MPCE (₹, 2011–12 prices)	612	758	−146***
Daily casual wage – dry season (₹)	58.4	72.6	−14.2***
Poverty headcount (%)	47.3	36.1	11.2***
Female LFPR (%)	28.6	31.4	−2.8**
Household size	5.32	4.98	0.34**
SC/ST household share (%)	32.8	24.5	8.3***
Landless / marginal (%)	58.7	52.3	6.4***

Note. ***, **, * denote significance at 1%, 5%, and 10% levels respectively. Authors' calculation using NSSO 61st round unit-level data.

5.2. Main DiD Estimates

Table 3 reports the baseline DiD estimates for the four primary outcomes. The interaction term Phase1 × Post is positive and statistically significant for log MPCE ($\beta = 0.068$, $p < 0.01$), implying that early roll-out raised real monthly per-capita consumption expenditure by approximately 6.8 per cent relative to the late-treated comparison group. The estimated effect on real dry-season casual wages is 0.045 ($p < 0.05$), corresponding to a 4.5 per cent wage premium in the lean season; the wet-season effect is smaller and statistically indistinguishable from zero. The poverty headcount falls by 4.2 percentage points ($p < 0.01$), and female labour force participation rises by 3.1 percentage points ($p < 0.05$). The pattern is consistent with H_1–H_3.

Table 3. Baseline Difference-in-Differences Estimates

Outcome	β (Phase1×Post)	Std. Error	p-value	N
Log MPCE	0.068***	0.019	0.001	82,431
Log casual wage (dry season)	0.045**	0.021	0.033	28,164
Log casual wage (wet season)	0.018	0.024	0.451	26,872
Poverty headcount	−0.042***	0.013	0.002	82,431
Female LFPR	0.031**	0.014	0.029	82,431

Note. All specifications include district and year fixed effects, household controls (size, dependency ratio, head's education, social group, land class), and a rainfall control. Standard errors clustered at the district level. ***, **, * denote significance at 1%, 5%, and 10% respectively. Source: Authors' estimation using NSSO 61st and 66th round unit-level data.

5.3, Heterogeneous Effects

Table 4 explores heterogeneity by land class and social group. The MPCE gain is concentrated among landless and marginal-landholding households ($\beta = 0.092$, $p < 0.01$), while the effect among medium and large landholders is statistically indistinguishable from zero. This pattern is consistent with the self-targeting logic of workfare (Besley & Coate, 1992) and confirms H_4. Disaggregation by social group reveals that scheduled-caste and scheduled-tribe households experience larger gains than the rest of the rural population on both consumption ($\beta = 0.087$) and female labour force participation ($\beta = 0.048$). These distributional patterns mirror those reported in Klonner and Oldiges (2022) and reinforce the equity case for the programme.

Table 4. Heterogeneous Treatment Effects

Subgroup	Log MPCE	Poverty	Female LFPR
Landless / marginal (≤1 acre)	0.092***	−0.058***	0.042**
Small (1–2 acres)	0.054**	−0.031*	0.025
Medium / large (>2 acres)	0.012	−0.008	0.011
Scheduled caste / tribe	0.087***	−0.061***	0.048***
Other social groups	0.058**	−0.031**	0.022*

Note. Each cell reports the coefficient on Phase1 × Post from a separate regression on the indicated subsample. All specifications include the same controls and fixed effects as Table 3. Source: Authors' estimation.

5.4. Robustness Checks

Several robustness exercises support the validity of the main findings. First, a placebo DiD using the 55th (1999–2000) and 61st (2004–05) NSSO rounds when no district was treated produces statistically insignificant placebo coefficients ($\beta = 0.008$, $p = 0.61$ for log MPCE), supporting the parallel-trends assumption. Second, restricting the comparison to Phase-II districts produces qualitatively similar but smaller estimates, as expected given the shorter treatment differential. Third, a triple-difference specification that adds a landless × Phase1 × Post interaction confirms that gains are concentrated among the most likely participants. Fourth, results are robust to including state-by-year fixed effects and to dropping high-leakage states identified in Niehaus and Sukhtankar (2013).

5.5. Discussion

The pattern of results is consistent with the workfare-with-rationing framework outlined in Section 3. The pronounced seasonality of the wage effect positive and significant in the dry season, negligible in the wet season accords with Imbert and Papp (2015) and provides indirect evidence that the programme is most binding when private-sector demand is weakest. The concentration of consumption gains among landless and marginal-landholding households is consistent with self-targeting, since the opportunity cost of public-works employment is lowest for these groups. The robust female-labour-force-participation effect, particularly among scheduled-caste and scheduled-tribe households, reinforces the gender-equity case made by Drèze and Khera (2017).

Two limitations deserve mention. First, the available NSSO rounds permit a medium-term evaluation only; longer-run effects on human capital formation, intergenerational mobility, and rural-urban migration require panel data of greater duration than was available at the time of writing. Second, the analysis cannot fully separate the direct income effects of programme participation from general-equilibrium effects on wages, although the inclusion of district fixed effects, year fixed effects, and

a battery of controls limits the scope for confounding. These limitations point toward fruitful directions for future research using longer panels and structural models.

VI. CONCLUSION AND POLICY IMPLICATIONS

This study has presented quasi-experimental evidence on the welfare effects of MGNREGA using a Difference-in-Differences design that exploits the phased roll-out of the programme across district cohorts. Four findings stand out. First, the programme raised real monthly per-capita consumption expenditure in treated districts by approximately 6.8 per cent. Second, it raised real casual-labour wages in the agricultural lean season by 4.5 per cent. Third, it lowered the rural poverty headcount by 4.2 percentage points. Fourth, it produced statistically significant gains in female labour force participation, with effects concentrated among scheduled-caste and scheduled-tribe households and among landless and marginal-landholding groups.

Three policy implications follow. First, the workfare design often criticised on efficiency grounds delivers self-targeting and labour-market spillovers that a pure cash transfer cannot easily replicate. Reforming MGNREGA toward a cash-transfer model would risk eroding precisely these benefits. Second, the variation in programme outcomes across states, well documented in Niehaus and Sukhtankar (2013) and Sukhtankar (2016), implies that strengthening implementation capacity particularly social audits, timely wage payment, and Aadhaar-based payment systems is essential to translate scheme outlays into welfare gains. Third, the demonstrated gains in female labour force participation suggest that the gender provisions of MGNREGA, including the one-third reservation and worksite childcare, deliver measurable empowerment dividends that should be retained and strengthened.

Three directions for future research are particularly promising. First, integrating administrative MIS data with household panel surveys would permit a more granular analysis of participation dynamics. Second, the long-run human-capital effects on schooling, nutrition, and intergenerational mobility warrant evaluation as longer panels become available. Third, the interaction of MGNREGA with other social-protection programmes such as the Public Distribution System and the Pradhan Mantri Jan Dhan Yojana is an open question of considerable policy relevance.

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