Does MGNREGS Promote Inclusive Growth? What do Evidence Indicate?

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ABSTRACT

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) in India seeks to provide a specified number of days of employment at a specified wage rate to interested rural households, and ensures equal wages between male and female workers. MGNREGS will benefit wage seekers directly by providing assured employment and pay, which will enhance their purchasing power; and indirectly by increasing the rural market wage rate. The nature of work of some employment opportunities under MGNREGS will likely improve the infrastructure at both community and individual levels, mostly of small-scale and marginal farmers, which is expected to improve the income levels of the poor. Using evidence from Andhra Pradesh before its bifurcation, the present study sought to determine if MGNREGS promotes inclusive growth. The empirical study used both primary and secondary data. The analyses reveal that MGNREGS promotes inclusive growth by augmenting open-market wages, reducing gender wage differentials, increasing the proportion of Scheduled Castes among the participating households, improving the employment and income levels of wage seekers, and deriving substantial benefits compared to government expenditure on the Scheme.

Keywords: labor employment, wage rate, gender wage, cost-benefit analysis, material components, MGNREGS

JEL Classification: Q19

INTRODUCTION

Numerous contemporary global economic issues require the immediate attention of economists and policy makers. One such issue is attaining broad-based economic growth. In the bid to catch up with developed countries, many developing countries concentrate on achieving high economic growth rates and lose sight of an important aspect of the growth process, which is the involvement of all sections of the population. As a result, even if developing countries realize reasonably good economic growth, a large segment of their population has remained outside the growth process. To overcome this deficiency, policymakers in developing countries have taken up various programs to improve the entitlement of vulnerable sections of the population and to enhance their productive capacity.

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)[1] is one of the notable programs being implemented in India. It seeks to provide a specified number of days of employment at a specified wage rate to interested rural households. Wage seekers are likely to benefit directly and indirectly from MGNREGS, which ensures equal wages for both male and female workers. The direct benefit is assured employment and wage for a specified number of days, which enhances rural households' purchasing power. The indirect benefit is the likely increase in the rural market wage rate. The nature of work of some employment opportunities under MGNREGS will likely improve the infrastructure at both community and individual levels, mostly of small-scale and marginal farmers, which is expected to improve the income levels of the poor.

The findings of various studies reviewed are mixed. Some of the benefits derived from the scheme are larger number of days of employment to the members of vulnerable segments of the population (Shah 2010, Kareemulla et al. 2010, Pramod et al. 2011), higher wage rate for work on private land (Nambiar et al. 2009), reduction in migration (Kareemulla et al. 2009, Reddy 2011), reduction in poverty level (Narayanan 2008, Galab et al. 2010, Suresh Babu et al. 2013), increase in household expenditure on the health and education of children (Kareemulla et al. 2009, Mathur 2008, Sashi Rekha 2013), and an increase in employment opportunities in general and employment opportunities for women in particular (Banerjee 2011, Khera et al. 2010, Dreze et al. 2011, Carswell et al. 2014, Suresh Babu et al. 2013).

At the same time, some studies have highlighted negative elements of the scheme like deficiencies in implementation of the scheme (Dreze 2009, Baisakh 2008, Haque 2011) poor coverage (Singh et al. 2007), delay in wage payment, failure in creation of durable assets (Nambiar et al. 2009), escalation in cost of cultivation on private lands due to hike in the market wage rate (Indrakant 2013). Some useful suggestions to improve the scheme have been made by Haque (2011), Chhabra et al. (2011), Kareemulla et al. (2013), Indrakant (2013a) and (2013b), Manikandan (2011).

1 The National Rural Employment Guarantee Act notified by the Government of India on September 7, 2005 aims to enhance the livelihood security of rural masses by providing at least 100 days of guaranteed wage employment in a financial year to every rural household whose adult members volunteer to do unskilled manual work. The Act covered 200 districts in its first phase, implemented on February 2, 2006, and was extended to 130 additional districts in 2007–2008. The scheme was extended to the remaining rural areas in the country from April 1, 2008. The rights-based approach is a salient feature of the Act.

OBJECTIVES OF THE STUDY

This study investigated whether MGNREGS promotes inclusive growth based on available evidence from Andhra Pradesh. The specific objectives of the study were to (1) analyze the trends in employment and wage rates under MGNREGS, (2) estimate the impact of MGNREGS on open-market wage rates, (3) assess the impact of MGNREGS on gender wage differentials, (4) estimate the benefit-cost ratio by comparing the extent of benefits derived by wage seekers and the costs incurred by the government in implementing MGNREGS.

METHODS

This study used primary data from a small field study as well as secondary data obtained from the official website of the Ministry of Rural Development and other related government websites and publications. The field study was conducted before the bifurcation of Andhra Pradesh. However, the analyses considered the implementation of MGNREGS in both the newly formed state of Telangana and the residuary Andhra Pradesh.

The trends in employment and wage rates were analyzed using statistical tools. The impact of the Scheme on open-market wage rates and gender wage differentials was estimated using regression analysis, in which intercept and slope dummy variables were incorporated. The scale of operation of MGNREGS in terms of number of days of employment generated and wage payment was also analyzed because the Scheme is being implemented in phases. In addition, the number of days of employment and wage rates received by households in Scheduled Castes or Scheduled Tribes[2] and by other households participating in the Scheme were analyzed comparatively.

ANALYSIS OF TRENDS IN EMPLOYMENT AND WAGES

MGNREGS was launched in Andhra Pradesh on 2 February 2006, in 13 Districts. The Scheme was extended to six more districts on 1 April 2007. Remaining three districts were brought under the Scheme in April 2008.[3]

Trends in Andhra Pradesh

Table 1 presents the trends in employment and wage rates under MGNREGS in Andhra Pradesh. In 2006–2007, 65 million person-days of employment[4] were generated in the first 13 districts included in the Scheme. In the subsequent year, this figure soared to 200 million person-days because the Scheme was intensified in the first 13 districts and extended to six more districts in Andhra Pradesh. The employment generated increased steadily since then, except in 2011–2012. In 2012–2013, the employment generated was 338 million person-days.

2 Certain groups of indigenous people in India who have remained backward have been designated as Scheduled Castes and Scheduled Tribes. The Constitution of India provides certain rights to these disadvantaged groups. According to the 2011 Census, the Scheduled Castes and Scheduled Tribes accounted for 16.6 percent and 8.6 percent, respectively (https://en.wikipedia.org/wiki/Scheduled_Castes_and_Scheduled_Tribes).

3 For the period covered in this study, INR 1.00 = USD 45.28 average in 2006–2007 and USD 54.41 average in 2012–2013 (Reserve Bank of India, Exchange Rate of the Indian Rupee https://www.rbi.org.in/scripts/PublicationsView.aspx?id=15268).

4 Person-days is product of number of persons employed and the number of days employed. It is a unit of measurement based on a standard number of man-hours in a day of work.

Table 1. Trends in employment and wage rates under MGNREGS in Andhra Pradesh

Serial No.	Year	Person-Days of Employment (millions)	Wages (hundred millions)	Households Participating in the Scheme (millions)	Average Employment Days per Household	Average Wage Rate per Person	Number of Rural Households in 2011 (%)	Number of Job Cards Issued (%)
1	2006–2007	65	54	2	30.13	81.09	14	43
2	2007–2008	200	168	4	42.48	82.38	28	94
3	2008–2009	227	190	5	39.54	82.45	34	33
4	2009–2010	390	352	6	63.87	89.95	42	59
5	2010–2011	340	330	6	53.83	96.98	42	96
6	2011–2012	304	297	5	59.46	97.19	35	41
7	2012–2013	338	359	6	56.78	105.14	42	75

Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

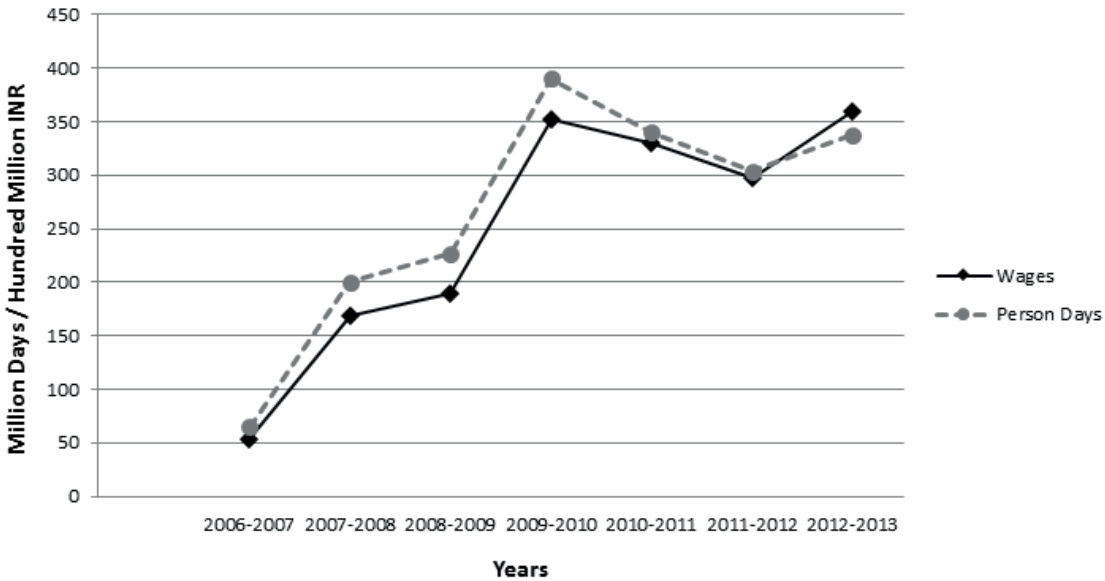
As expected, there was a high correlation between the wage payment and days of employment generated under MGNREGS from 2006–2007 to 2012–2013. The wage payment was about 100 times the days of employment generated. The number of participating households surged from 2.1 million in 2006–2007 to 5.8 million in 2012–2013, registering a three-fold increase. The average employment generated per household also increased from 36 days to 57 days. The three indicators—number of days of employment generated, number of participating households, and average employment days per household—show that the scheme was reinforced over time. The wage rate per day increased from INR 81.09 to INR 105.14. It should be noted that the wage rate was below the rate stipulated by the government because workers required more than the specified time to complete the task. Figure 1 further illustrates these trends.

Comparison of Trends in Andhra Pradesh and India

Approximately 40 percent of rural households participated in MGNREGS from 2006–2007 to 2012–2013, reflecting the substantial coverage of the scheme. There were fluctuations in the percentage of job cardholders that participated in the scheme because many households were compelled to participate during bad agricultural years, while some households did not participate despite having job cards.

As presented in Table 2, a comparison with the all-India performance revealed that the employment provided per household was generally higher but the wage rate per day per person was marginally lower in Andhra Pradesh. Figures 2 and 3 further illustrate these trends.

Figure 1. Trends in person days of employment (millions) and wage rates (hundred millions) under MGNREGS in Andhra Pradesh



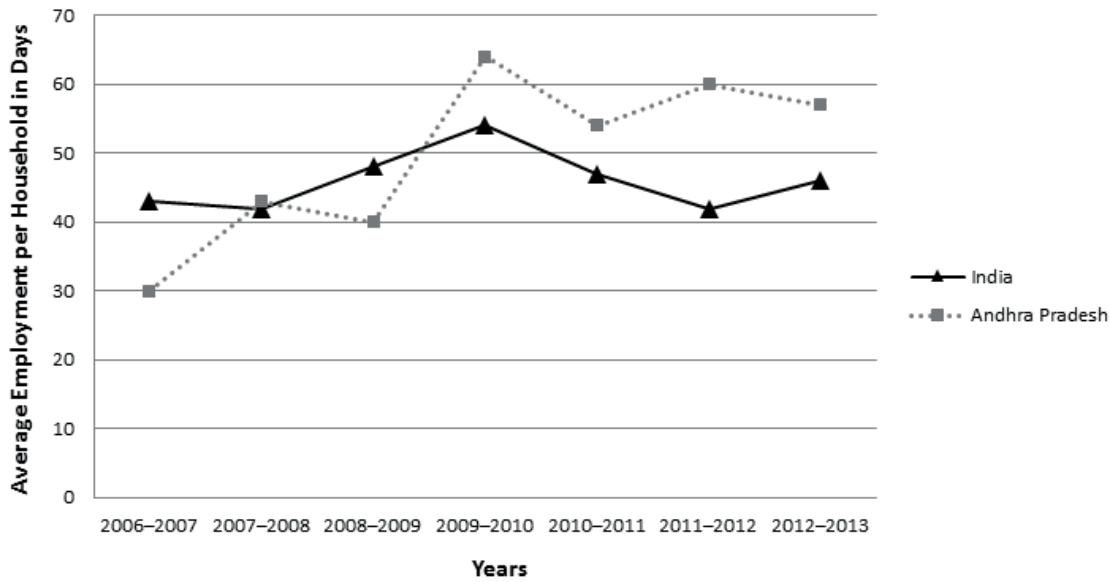
Sources: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance
Government of India, NREGA, at a Glance

Table 2. Trends in employment and wage rates under MGNREGS in Andhra Pradesh and India

Serial No.	Year	Average Employment Days per Household		Average Wage Rate per Person	
		India	Andhra Pradesh	India	Andhra Pradesh
1	2006–2007	43	30	65	81
2	2007–2008	42	43	75	82
3	2008–2009	48	40	84	83
4	2009–2010	54	64	89	90
5	2010–2011	47	54	99	97
6	2011–2012	42	60	113	97
7	2012–2013	46	57	121	105

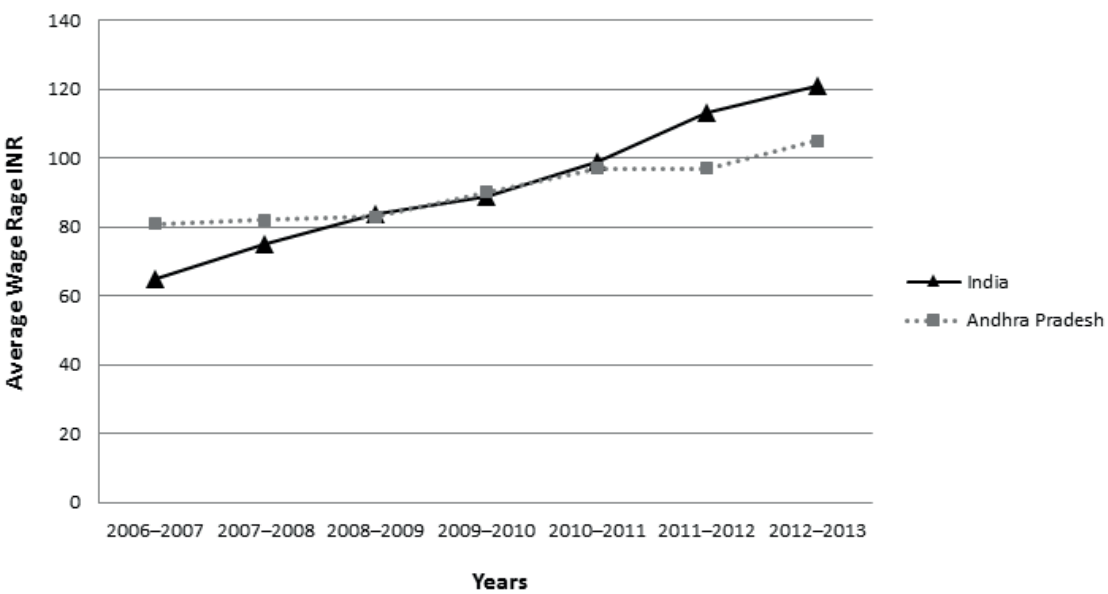
Sources: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance
Government of India, NREGA, at a Glance

Figure 2. Trends in average employment days per household under MGNREGS in Andhra Pradesh and India



Sources: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance
Government of India, NREGA, at a Glance

Figure 3. Trends in average wage rates per person under MGNREGS in Andhra Pradesh and India



Sources: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance
Department of Rural Development, Hyderabad, Government of India 2011

Wages and Material Components

Table 3 presents the wages and material components in MGNREGS in Andhra Pradesh. An analysis of composition of expenditure on MGNREGS in Andhra Pradesh revealed that the wage component decreased over the years. This shows that asset-creation was highlighted in 2010–2011. In 2006–2007, the wage component was 97 percent, which declined to 85 percent in the following year. These figures show that only labor-intensive employment opportunities were undertaken in 2006–2009. The wage component dropped to 66 percent in 2010–2011 but increased to 77 percent and 74 percent in 2011–2012 and 2012–2013, respectively. The declining trend in wage component can be attributed to the inclusion of asset creation in the scheme. This policy shift increased the government expenditure required to generate one-day employment from INR 84 in 2006–2007 to INR 144 in 2012–2013.

Regional Trends

Table 4 presents the trends in employment and wage rates by region. The analysis of regional trends revealed that in Coastal Andhra, which covers the area between the Eastern Ghats and the Bay of Bengal from the northern border of Odisha to the south of the delta of the Krishna River, both employment and wages were low in 2007–2009. From 2009–2010 onwards, the duration of employment provided per household was approximately 60 days and the wages paid ranged from INR 85 to INR 100 per day. This region is composed of nine districts: Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam, and Nellore. In Rayalaseema, a geographic region in Andhra Pradesh, the duration of employment provided per household ranged from 85 days to 105 days. However, the wages paid were relatively lower and ranged from INR 60 to INR 80 per day. It appears that the wage seekers in Rayalaseema took relatively more time to complete a given task.

Table 3. Trends in employment and wage rates under MGNREGS in Andhra Pradesh

Serial No.	Year	Wages (INR Crores)	Material and Skilled Wages (INR Crores)	Total Expenditure (INR Crores)	Share of Wages (%)	Person-Days of Employment Generated (Crores)	Expenditure per Person Days (INR)
1	2006–2007	540	14	554	97	6.5	84
2	2007–2008	1,677	299	1,976	85	20	99
3	2008–2009	1,901	573	2,474	77	22.7	109
4	2009–2010	3,522	454	3,976	89	39	102
5	2010–2011	3,301	1,690	4,991	66	34	147
6	2011–2012	2,969	883	3,852	77	30.4	127
7	2012–2013	3,587	1,290	4,877	74	33.8	144

Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

Table 4. Trends in employment and wage rates under MGNREGS in Andhra Pradesh

Serial No.	Year	Wages (INR Crores)	Material and Skilled Wages (INR Crores)	Total Expenditure (INR Crores)	Share of Wages (%)	Person-Days of Employment Generated (Crores)	Expenditure per Person Days (INR)
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3	2008–2009	1,901	573	2,474	77	22.7	109
4	2009–2010	3,522	454	3,976	89	39	102
5	2010–2011	3,301	1,690	4,991	66	34	147
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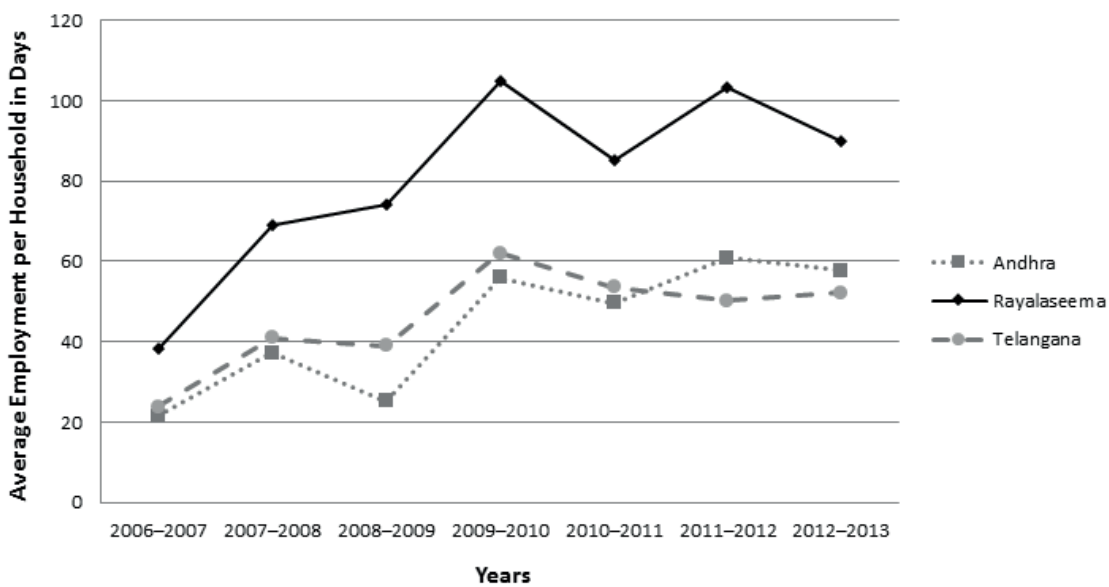
7	2012–2013	3,587	1,290	4,877	74	33.8	144

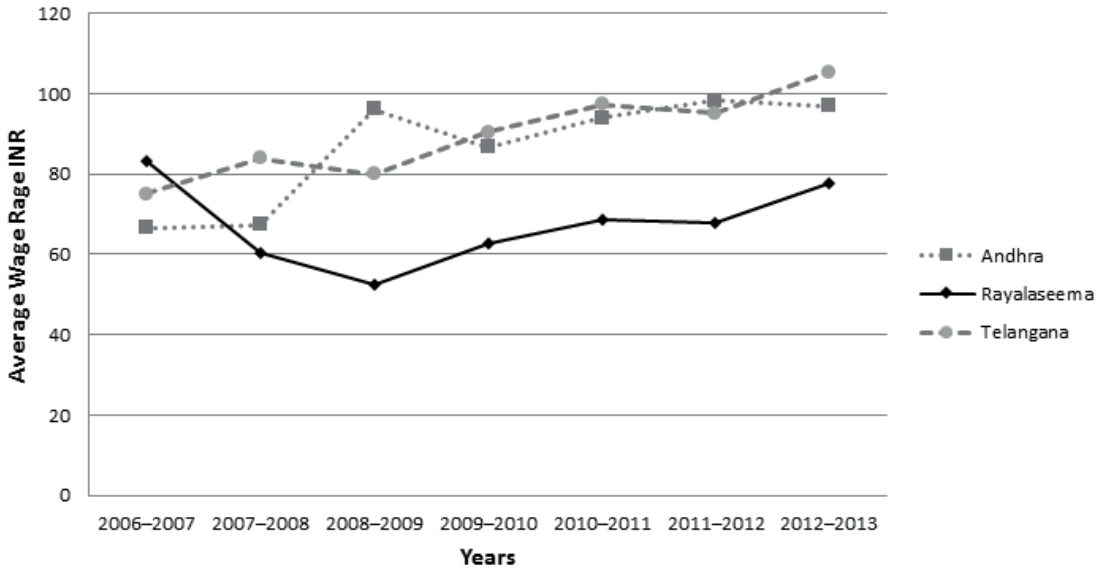
Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

Figure 4. Trends in employment by region



Sources: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance
Department of Rural Development, Hyderabad, Government of India 2011

Figure 5. Trends in wage rates by region



Sources: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance
Department of Rural Development, Hyderabad, Government of India 2011

This region comprises four southern districts: Anantapur, Chittoor, Kadapa, and Kurnool. In Telangana, the duration of employment provided per household ranged from 50 days to 60 days and the wages paid ranged from INR 90 to INR 105 per day. Coastal Andhra and Telangana exhibited a similar pattern in which participating households received relatively higher wages but fewer days of employment compared to Rayalaseema. Figures 4 and 5 further illustrate these trends.

IMPACT OF MGNREGS ON MARKET WAGE RATES

MGNREGS generates additional demand for labor and consequently influences market wage rates. Hence, the present study estimated the impact of MGNREGS on market wage rates by regressing market wage rate on time. Time was classified into two sub-periods: Sub-period I, before the implementation of MGNREGS (1998–1999 to 2005–2006); and Sub-period II, after the implementation of MGNREGS (2006–2007 to 2012–2013). To distinguish the two periods, the dummy variable technique (intercept and slope) was employed. The exercise was carried out in both absolute terms and log terms. Table 5 presents the particulars of data on plough wage rates.

Table 6 presents the impact of MGNREGS on market wage rates. A simple regression equation (Equation No. 1) with time as the independent variable revealed that on average, plough wage rates in Andhra Pradesh increased at a rate of INR 11 per annum during study period. The explanatory power of the equation was high at 74 percent. When intercept and slope dummy variables were included in the equation separately (i.e., Equation No. 2 and Equation No. 3), the results were discouraging. Hence, slope and intercept dummy variables were introduced simultaneously, along with time in Equation No. 4. It is interesting to note that the estimate of intercept dummy was negative,

Table 5. Particulars of data on market wage rates

Year	Time	Market Wage Rates (INR)	Log of Water Rates	Intercept Dummy	Slope Dummy
1998–1999	1	52.89	3.97	0	0
1999–2000	2	51.73	3.95	0	0
2000–2001	3	55.85	4.02	0	0
2001–2002	5	57.91	4.06	0	0
2002–2003	6	62.11	4.13	0	0
2003–2004	7	59.87	4.09	0	0
2004–2005	8	60.16	4.10	0	0
2005–2006	9	67.81	4.22	0	0
2006–2007	10	76.97	4.34	1	10
2007–2008	11	89.49	4.49	1	11
2008–2009	12	113.32	4.73	1	12
2009–2010	13	140.00	4.94	1	13
2010–2011	14	181.79	5.20	1	14
2011–2012	15	207.96	5.34	1	15
2012–2013	16	244.52	5.50	1	16

Source: Labour Bureau, Wage Rate in Rural India

Table 6. Impact of MGNREGS on market wage rates

Equation No.	Constant	Coefficient of Independent Variable			R^2	ADJ R^2
		Time	Intercept Dummy	Slope Dummy		
1	1.703 (18.664)	11.34 (1.879)			0.737	0.717
2	5.174 (22.732)	10.41 (3.731)	10.034 (34.455)		0.739	0.695
3	26.888 (22.514)	5.183 (3.922)		4.78 (2.73)	0.791	0.756
4	50.134 (4.847)	1.64 (0.836)	-274.7 (16.662)	27.2 (1.47)	0.992	0.990

Note: Figures in parentheses are standard error of estimated parameters

R^2 = Explanatory power of the regression equation

while the estimate of slope dummy was positive. In addition, the wage rates increased by less than INR 2 per annum during Sub-period I and increased by INR 29 per annum thereafter. The explanatory power of the equation was high at 99 percent, reflecting the positive impact of MGNREGS on market wage rates.

The regression results in log form broadly confirm the results obtained using absolute figures. The market wage rates in Andhra Pradesh increased at a rate of 10 percent during the study period. When both intercept and slope dummies were introduced along with time, the results indicated that the wage rates increased at

a rate of 3 percent in Sub-period I and at a rate of 20 percent in Sub-period II. This increase is higher than the inflation rate. It implies that the scheme improved not only the money wage rates but also the real wage rates received by workers in the open market.

Scale of Operation

Table 7 presents the particulars of data on scale of operation and plough wage rates. The scale of operation, which was measured in terms of person-days of employment generated and expenditure on wages, was low in 2006, increased in 2007 until 2009–2010, and stabilized thereafter. Hence, to measure the impact of the scale of operation on market wage rates along with time, the index of person-days of employment generated and the index of expenditure on wages were used as independent variables.

Tables 8 and 9 present the regression results of scale of operation on market wage rates and on log of market wage rates, respectively. The statistical results revealed that the scale of operation had a positive impact on market wage rate. Market wage rate increased at a rate of INR 5 per annum (Co-efficient of Time variable in Equation No. 1). In addition, when 1 million person-days of employment were generated further, market wage rate increased by INR 15 (Co-efficient of Person Days of Employment in Equation No.1). When INR 100,000,000 of expenditure on wages were generated further, market wage rates increased by INR 16 (Co-efficient of Expenditure incurred on Wages in Equation No. 2). The regression results in log form match the regression results in absolute terms.

Table 7. Particulars of data on scale of operation and market wage rate

Year	Time	Market Wage Rate	Log of Wage Rate	Intercept Dummy	Slope Dummy	Expenditure on Wages under MGNREGS (hundred millions)	Person-Days of Employment under MGNREGS (millions)
1998–1999	1	52.89	3.97	0	0	0	0
1999–2000	2	51.73	3.95	0	0	0	0
2000–2001	3	55.85	4.02	0	0	0	0
2001–2002	5	57.91	4.06	0	0	0	0
2002–2003	6	62.11	4.13	0	0	0	0
2003–2004	7	59.87	4.09	0	0	0	0
2004–2005	8	60.16	4.10	0	0	0	0
2005–2006	9	67.81	4.22	0	0	0	0
2006–2007	10	76.97	4.34	1	10	54	65
2007–2008	11	89.49	4.49	1	11	168	200
2008–2009	12	113.32	4.73	1	12	190	227
2009–2010	13	140.00	4.94	1	13	352	390
2010–2011	14	181.79	5.20	1	14	330	340
2011–2012	15	207.96	5.34	1	15	297	304
2012–2013	16	244.52	5.50	1	16	359	338

Source: Labour Bureau, Wage Rate in Rural India

Table 8. Trends in employment and wage rates under MGNREGS in Andhra Pradesh and India

Equation No.	Constant	Coefficient of Independent Variable			R^2	ADJ R^2
		Time	Person Days of Employment (millions)	Expenditure Incurred on Wages (hundred millions)		
1	30.527 (20.109)	4.771 (3.204)	15.156 (6.387)		0.821	0.791
2	39.348 (17.584)	2.996 (2.791)		16.559 (4.807)	0.868	0.846
3	43.782 (7.719)	3.059 (1.221)	-88.063 (12.250)	92.177 (10.727)	0.977	0.970

Notes: Figures in parentheses are standard error of estimated parameters
R^2 = Explanatory power of the regression equation

Table 9. Regression results of scale of operation on log of plough wage rates

Serial No.	Constant	Coefficient of Independent Variable			R^2	ADJ R^2
		Time	Person Days of Employment (millions)	Expenditure Incurred on Wages (hundred millions)		
1	3.812 (0.107)	0.047 (0.017)	0.130 (0.034)		0.929	0.917
2	3.858 (0.088)	0.038 (0.014)		0.129 (0.024)	0.954	0.946
3	3.878 (0.058)	0.038 (0.009)	-0.379 (0.092)	0.455 (0.081)	0.982	0.997

Notes: Figures in parentheses are standard error of estimated parameters
R^2 = Explanatory power of the regression equation

IMPACT OF MGNREGS ON GENDER WAGE DIFFERENTIALS

MGNREGS is a rural wage employment program, and its architects recognized the need to incorporate gender equity and women empowerment in its design. Various provisions under the Scheme and its guidelines aim to ensure that women have equitable and easy access to work, decent working conditions, equal payment of wages, and representation in decision-making bodies. MGNREGS is expected to have a good effect on the economic and social empowerment of women, and it is likely to reduce traditional gender wage discrimination even in open markets. Hence, the present study estimated the impact of MGNREGS on gender differences in market wage rates. Time was classified into two sub-periods: Sub-period I, before the

Table 10. Particulars of gender wage ratio and wage difference

Year	Field Labor		Time	Intercept Dummy	Slope Dummy	M-F	M/F
	Male	Female					
2002–2003	49.14	36.10	1	0	0	13.04	1.36
2004–2005	55.8	40.40	3	0	0	15.40	1.38
2005–2006	61.7	44.12	4	0	0	17.58	1.40
2006–2007	68.95	50.01	5	1	5	18.94	1.38
2007–2008	85.22	61.34	6	1	6	23.88	1.39
2008–2009	107.53	78.23	7	1	7	29.30	1.37
2009–2010	128.29	95.34	8	1	8	32.95	1.35
2010–2011	150.43	115.34	9	1	9	35.09	1.30
2011–2012	175.98	134.16	10	1	10	41.82	1.31

Notes: M-F = Difference between male and female wage rates; M/F = Ratio of male wage rates to female wage rates
Sources: AP State Portal, Andhra Pradesh Statistical Abstract; Labor Bureau, Wage Rate in Rural India

implementation of MGNREGS (2002–2003 to 2005–2006); and Sub-period II, after the implementation of MGNREGS (2006–2007 to 2011–2012). To distinguish the two periods, the dummy variable technique (intercept and slope) was employed. The exercise was carried out in absolute terms. Table 10 presents the particulars of gender wage ratio and wage difference. The ratio of male wage rates to female wage rates was the dependent variable in the analysis.

Table 11 presents the regression results of gender wage differentials. With time as the independent variable and ratio of wage rates as the dependent variable, a simple regression equation revealed that gender differences in wage rates narrowed as the ratio of male wage rates to female wage rates decreased at a rate of 0.008 (Co-efficient of Time variable in Equation No. 1) per annum during the study period. Wage differences widened at a rate of 0.012 (Co-efficient of Time variable in Equation No. 4) per annum in Sub-period I and narrowed at a rate of 0.018 (i.e., 0.012-0.03 the difference between co-efficient of time variable and co-efficient of slope dummy variable in Equation No. 4) per annum in Sub-period II.

SELECTED VILLAGE ANALYSIS

An in-depth study of six villages spread across three districts with varying levels of performance was conducted. The districts were selected on the basis of two performance indicators: average employment per household and average wage rate per person. The three districts were Ranga Redd, a relatively better performing district; Nizamabad, a moderately performing district; and Warangal, a district with lagging performance. Two villages were selected from each of the three districts: Kothlapur and Gottiga Khurd from Ranga Reddy, Rudraram and Tujalpur from Nizamabad, and Kodvatoor and Janakipur from Warangal. The analysis was based on both primary and secondary data.

Tables 12 and 13 present the particulars of employment and wage rates by village in 2011–2012 and 2012–2013, respectively. Village-level factors, such as the magnitude of labor force and understanding among the laborers, area under cultivation, natural endowments of village, and availability of alternative jobs, influence the operation of MGNREGS

Table 11. Regression results of gender wage differentials

Equation No.	Constant	Coefficient of Independent Variable			R^2	ADJ R^2
		Time	Intercept Dummy	Slope Dummy		
1	1.407 (0.02)	-0.008 (0.003)			0.47	0.394
2	1.411 (0.022)	-0.011 (0.006)	0.026 (0.034)		0.52	0.355
3	1.396 (0.03)	-0.003 (0.011)		-0 (0.008)	0.49	0.321
4	1.348 (0.02)	0.012 (0.007)	0.135 (0.034)	-0.03 (0.008)	0.88	0.807

Notes: Figures in parentheses are standard error of estimated parameters
R^2 = Explanatory power of the regression equation

substantially. For instance, in 2011–2012, the days of employment generated per participating household ranged from 36 days to 95 days, while the wage rates ranged from INR 69 to INR 124 in the six selected villages. MGNREGS provided a relatively higher number of days of employment to participating households in Kothlapur and Gottiga Khurd because the scope for alternative employment is limited in these two backward villages.

In Nizamabad, the performance of the Scheme in Rudraram was better than in Tujalpur. The village has a big tank and is close to the Nizamsagar irrigation project. Most of the wage seekers were engaged in the strengthening of bund, desilting of tanks, and silt application to the lands of marginal and small-scale farmers. In Tujalpur, employment generation was poor partly because of administrative problems in the implementation of the scheme and the availability of adequate alternative employment, such as loading of lorries besides cultivation. In Kodvatoor and Janakipur in Warangal, employment opportunities provided to wage seekers were relatively few. This can be attributed to the proximity of these villages to the urban centers of Warangal and Jangaon. Many people commute to these urban centers to work.

A category analysis revealed that in general, wage seekers who belong to Scheduled Castes participated more in MGNREGS. Wage seekers from Kothlapur, Gottiga Khurd, and Rudraram who belong to Scheduled Castes participated more in MGNREGS compared to wage seekers from the same category in other villages. For instance, in Kotlapur, Scheduled Caste households worked for 111 days, while the village average was only 95 days per household, in 2011–2012. Similarly, in Gottiga Khurd, Scheduled Caste households worked for 107 days, while the village average was only 86 days per households. This indicates that Scheduled Caste households, especially those in backward areas, largely depend on the scheme.

The wage rates in the six selected villages range from INR 66 to INR 124 in 2011–2012 and from INR 78 to INR 141 in 2012–2013. This variation was due to the nature of employment opportunities offered by the scheme in those villages. The extent of understanding among the members of labor groups and the efficiency of MGNREGS staff contributed to this pattern. It should be noted that inter-village differences are wider than inter-class differences.

The heavy dependence of Scheduled Caste groups on MGNREGS is evidenced by the high percentage of households from such groups participating in the scheme. In Kothlapur,

Table 12. Particulars of employment and wage rates by village (2011–2012)

S. No.	Village	Average Employment Days per Household			Average Wage Rate per Person			Percentage Share in Participating Household		
		SC	BC	All	SC	BC	All	SC	BC	All
1	Kothlapur	111	73	95	113	118	115	56	40	100 (348)
2	Gottiga Khurd	107	81	86	65	66	66	22	66	100 (258)
3	Rudraram	102	84	91	125	123	124	47	46	100 (190)
4	Tujalpur	49	43	45	77	70	73	39	57	100 (508)
5	Kodvatoor	63	46	48	101	104	102	15	70	100 (494)
6	Janakipur	28	40	36	68	69	69	33	66	100 (233)

Note: Figures in parentheses indicate aggregates; SC = Scheduled Castes; BC = Backward Castes
Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

Table 13. Particulars of employment and wage rates by village (2012–2013)

S. No.	Village	Average Employment Days per Household			Average Wage Rate per Person			Percentage Share in Participating Household		
		SC	BC	All	SC	BC	All	SC	BC	All
1	Kothlapur	59	39	51	122	120	121	59	33	100 (356)
2	Gottiga Khurd	80	73	71	92	91	91	17	70	100 (250)
3	Rudraram	58	58	56	145	145	145	44	48	100 (225)
4	Tujalpur	42	37	38	86	87	86	37	59	100 (506)
5	Kodvatoor	66	55	57	129	128	129	15	70	100 (461)
6	Janakipur	59	66	63	93	69	78	35	63	100 (249)

Note: Figures in parentheses indicate aggregates; SC = Scheduled Castes; BC = Backward Castes
Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

more than half of the participating households belonged to Scheduled Castes. This was also observed in other selected villages, albeit not with same intensity.

Extent of Participation and Wage Rates

One of the questions that this study sought to answer was whether a household that worked for a higher number of days earned a higher wage rate per day. The total wages earned by a household was regressed on the number of days worked. The results indicated a good linear fit. The coefficient of independent variable showed that a household had additional earnings by working for one more day. This can be referred to as the marginal wage rate. As shown in Tables 14 and 15, the marginal wage rate across the six

Table 14. Regression of total wages earned on number of days worked by households

Serial No.	District	Mandal	Village	Constant	Coefficient of Independent Variable	R^2
1	Ranga Reddy	Marpally	Kothlapur	131.446 (67.668)	114.055 (0.623)	0.990
2		Basheerabad	Gottiga Khurd	-72.098 (89.632)	67.354 (0.908)	0.956
3	Nizamabad	Yellareddy	Rudraram	-127.632 (64.303)	125.619 (0.613)	0.996
4		Domakonda	Tujalpur	102.309 (52.550)	71.797 (0.876)	0.930
5	Warangal	Bachannapet	Kodavatoor	8.571 (43.036)	109.783 (0.703)	0.980
6		Dharmasagar	Janakipur	-168.336 (47.575)	74.039 (1.072)	0.954

Notes: Figures in parentheses are standard error of estimated parameters; R^2 = Explanatory power of the regression equation

Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

Table 15. Regression of total wages earned on number of days worked by household (2012–2013)

Serial No.	District	Mandal	Village	Constant	Coefficient of Independent Variable	R^2
1	Ranga Reddy	Marpally	Kothlapur	154.832 (64.735)	116.971 (1.058)	0.972
2		Basheerabad	Gottiga Khurd	205.233 (127.724)	88.919 (1.498)	0.934
3	Nizamabad	Yellareddy	Rudraram	101.379 (61.118)	142.968 (0.979)	0.990
4		Domakonda	Tujalpur	-160.055 (32.363)	92.940 (0.700)	0.972
5	Warangal	Bachannapet	Kodavatoor	-434.668 (59.432)	137.169 (0.825)	0.984
6		Dharmasagar	Janakipur	-292.904 (125.348)	83.270 (1.661)	0.910

Notes: Figures in parentheses are standard error of estimated parameters; R^2 = Explanatory power of the regression equation

Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

selected villages ranged from INR 74 to INR 126 in 2011–2012 and between INR 83 to INR 142 in 2012–2013. The estimates of coefficient of independent variable were significant, while the estimates of constant term were insignificant. This implies that the relationship between the two variables can be represented by a line passing through the origin, which means that marginal wage rates and average wage rates broadly matched each another. For instance, in Kothlapur, the average wage rate was INR 115, while the marginal wage rate was INR 114, in 2011–2012. Hence, the wage rate per day earned by a household working for 30 days was similar to that of a household working for 40 days.

Extent of Participation and Size of Household

During field visits to the six selected villages, it was observed that the extent of a household's participation in MGNREGS was greatly influenced by its size. A major disadvantage of a small household is the lack of members available to work in case a particular earner is unable to do so. For example, if one of the earners in the household becomes sick, that person will not be able to participate in the scheme, along with the person in charge of administering care. A large household has more members available to work until they complete the stipulated number of days. To examine this issue, the number of days worked by a household was regressed on the number of laborers in the household. The coefficient of independent variable showed the expected additional number of days a household can work under the scheme with additional labor in the household. The estimated coefficient of independent variable was positive and statistically significant for 2011–2012 and 2012–2013 but differed from one village to another. A positive sign indicates that a larger household was more likely to participate for a higher number of days during both years. The magnitude of the coefficient of independent variable for the six selected villages ranged from 14 days to 44 days in 2011–2012 and from 19 days to 36 days in 2012–2013. Tables 16 and 17 present the regression results.

In 2011–2012, a household with three wage seekers in Kothlapur and in Janakipur was likely to work for 44 days more and 14 days more, respectively, than a household with only two wage seekers. It should be noted that the magnitude of the independent variable was 50 percent or less than the average employment generated per household under the scheme. This is due to the fact that the average number of earners per household was either two or slightly more than two. In addition, the coefficient of constant term in many cases was statistically significant. This implies that the relationship between the two variables can be represented by a line that does not pass through the origin, and the low R^2 indicates that the linear form is not a good fit. Hence, household size is an important determinant of extent of participation of a household under MGNREGS, and the relationship is positive but not linear.

COST-BENEFIT ANALYSIS

Primary data collected from six selected villages spread across the three districts were used to estimate the benefit-cost ratio of MGNREGS. Approximately 35 households participating in the scheme were selected from each village. The beneficiaries were categorized into regularly participating in the scheme, and occasionally participating in the scheme. The selected sample adequately represented both the categories of beneficiaries.

A total of 210 households were included in the sample. It should be noted that many of the beneficiaries had a small piece of land and earned some income by cultivating that piece of land.

Table 18 presents figures on the pattern of employment. Before the implementation of MGNREGS, wage seekers worked for 35 days on their own piece of land and 160 days as wage laborers. Thus, on the average, wage seekers had 195 days of employment. After the implementation of MGNREGS, on the average, wage seekers were given 33 days of work under the scheme and continued to work for 35 days on their own piece of land. However, wage seekers' employment in the open market dropped to 144 days due to the hike in market wage rates. Generally, wage seekers' total days of employment increased from 195 days to 212 days.

Table 16. Regression of number of days worked by household on number of laborers in household (2011–2012)

Serial No.	District	Mandal	Village	Constant	Coefficient of Independent Variable	R^2
1	Ranga Reddy	Marpally	Kothlapur	2.822 (5.325)	44.156 (2.360)	0.503
2		Basheerabad	Gottiga Khurd	30.278 (4.542)	24.149 (1.704)	0.440
3	Nizamabad	Yellareddy	Rudraram	18.996 (7.035)	31.953 (2.842)	0.402
4		Domakonda	Tujalpur	-0.741 (3.329)	21.237 (1.384)	0.318
5	Warangal	Bachannapet	Kodavatoor	7.788 (3.316)	19.555 (1.452)	0.269
6		Dharmasagar	Janakipur	6.707 (3.783)	14.430 (1.713)	0.235

Notes: Figures in parentheses are standard error of estimated parameters; R^2 = Explanatory power of the regression equation
Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

Table 17. Regression of number of days worked by household on number of laborers in household (2012–2013)

Serial No.	District	Mandal	Village	Constant	Coefficient of Independent Variable	R^2
1	Ranga Reddy	Marpally	Kothlapur	10.44 (4.185)	18.550 (1.781)	0.235
2		Basheerabad	Gottiga Khurd	-5.975 (4.495)	36.084 (1.902)	0.592
3	Nizamabad	Yellareddy	Rudraram	24.464 (4.794)	16.208 (2.298)	0.182
4		Domakonda	Tujalpur	-1.514 (2.127)	19.366 (0.947)	0.453
5	Warangal	Bachannapet	Kodavatoor	6.623 (4.103)	25.710 (1.890)	0.287
6		Dharmasagar	Janakipur	6.544 (4.957)	27.906 (2.227)	0.389

Notes: Figures in parentheses are standard error of estimated parameters; R^2 = Explanatory power of the regression equation
Source: Government of Andhra Pradesh, R1.1 MGNREGS–AP at a Glance

Table 18. Impact of MGNREGS on employment days per earner

Serial No.	Item	MGNREGS	
		Before	After
1	MGNREGS	-	33
2	Wage Employment	160	144
3	Self-Employment	35	35
4	Total (2+3)	195	179
5	Total (1+2+3)	195	212

Source: Field Survey

Table 19 presents the impact of MGNREGS on market wage rates. On the average, market wage rates for male and female wage seekers in the six selected villages increased from INR 80 to INR 193 and from INR 44 to INR 115, respectively. Thus, on the average, wage seekers' open-market wage rates increased from INR 62 to INR 154.

Data on income from cultivation were not collected in the field survey. However, the value of the days worked by wage seekers on their own piece of land was imputed at market wage rates. As shown in Table 20, the computation revealed that the income of an earner before the implementation of MGNREGS was INR 12,090 in 2006–2007 at current prices (i.e., 2006–2007 prices), which increased to INR 31,295 in 2012–2013 at current prices (i.e., 2012–2013 prices). Incomes at 2006–2007 prices are expressed in 2012–2013 prices, using Prices Inflator of GSDP from agriculture sector in Andhra Pradesh (i.e., 1.84)[5]. Therefore, the income of an earner in 2006–2007 at 2012–2013 prices was estimated to be INR 22,246. Thus, the increase in income of an earner due to the scheme at 2012–2013 prices was INR 9,049 (i.e., 31,295–22,246).

In terms of government expenditure, a field survey of six villages in 2012–2013 revealed that wage seekers were given 33 days of employment at a wage rate of INR 113 per day in 2012–2013. Thus, the wage bill per worker was INR 2,729. In 2012–2013, the wage component was 74 percent of the total expenditure. The total expenditure per wage seeker was INR 5,039. Hence, in general, the benefit derived by a wage seeker from the scheme was INR 9,040 per annum, while the expenditure incurred by the government was INR 5,039 per annum. The benefit-cost ratio is 1.8. Therefore, for every INR 1 spent by the government, a wage seeker derived a benefit of about INR 2.

SUMMARY AND CONCLUSION

The three indicators—number of days of employment generated, number of participating households, and average employment days per household—show that the Scheme was reinforced over time. The wage rate per day increased from INR 81.09 to INR 105.14 during the study period. It should be noted that the wage rate was below the rate stipulated by the Government because workers required more than the specified time to complete the task.

The wage component in total expenditure on MGNREGS decreased over the years, which can be attributed to asset creation. This policy shift increased the government expenditure required to generate one-day employment from INR 84 in 2006–2007 to INR 144 in 2012–2013.

Nearly half of the rural households participated in the scheme during the study period. A category analysis revealed that in general, wage seekers who belong to Scheduled Castes participated more in MGNREGS in terms of number of days worked. Participating household in Coastal Andhra and Telangana received relatively higher wage rates but fewer days of work than participating households in Rayalaseema.

The regression analysis revealed that market wage rates in Andhra Pradesh increased by 20 percent or INR 29 per annum after the implementation of MGNREGS, which was higher than the inflation rate. The increase in market wage rates was only 3 percent or INR 2 per annum before the scheme took effect. Gender wage differentials, or the ratio of male

5 Conceptually Price Inflator 1.84 implies that in 2012-2013 INR 1.84 was required to buy items which could have been bought for INR 1 in 2006-2007. It is obtained as a ratio of price index of 2012-2013 to the price index of 2006-2007. The price index for these two years were obtained as ratio of GSDP from agriculture sector in Andhra Pradesh at Current Prices to the GSDP from agriculture sector in Andhra Pradesh at Constant Prices.

Table 19. Impact of MGNREGS on wage rates

Serial No.	Item	MGNREGS	
		Before	After
1	MGNREGS	-	113
2	Wage Employment (Men)	80	193
3	Wage Employment (Women)	44	115
4	Average	62	154

Source: Field Survey

Table 20. Impact of MGNREGS on employment days per earner

Serial No.	Item	Income per Earner (INR)
1	Before MGNREGS at 2006–2007 prices	12,090
2	Before MGNREGS at 2012–2013 prices	22,246
3	After MGNREGS at 2012–2013 prices	31,295

Source: Field Survey

wage rates to female wage rates, widened at a rate of 0.012 per annum before the scheme began and narrowed at a rate of 0.018 per annum thereafter.

The wages earned by a household are proportional to the number of days worked by the household. A household that works for a higher number of days cannot expect to earn a higher wage rate. During field visits to the six selected villages, it was observed that the extent of a household's participation in MGNREGS was greatly influenced by its size. Hence, a larger household is more likely to engage in more days of work. The benefit cost-ratio, which was estimated by comparing the extent of benefits derived by wage seekers and the costs incurred by the government in implementing MGNREGS, is 1.8. Therefore, for every INR 1 spent by the government, a wage seeker derived a benefit of about INR 2. In general, the benefit derived by a wage seeker from the scheme was INR 9,040 per annum, while the expenditure incurred by the government was INR 5,039 per annum.

Even as there remain areas for improvement, MGNREGS is shown to promote inclusive growth: by augmenting open-market wages, reducing gender wage differentials, increasing the proportion of Scheduled Castes among the participating households, improving the employment and income levels of wage seekers, and deriving substantial benefits compared to government expenditure on the scheme.

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