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# Navigating the impact of average daily wages on employment rates: A study of rural India

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**Abstract**
India being a country where more than half of the population depends on agriculture and other related activities, it is important to study how average daily wages affect the livelihood of the rural population thereby impacting the employment rates. The objective of the paper is to analyse the factors influencing the employment rates in rural areas with a special focus on average daily wages, rural population and literacy rates. The purpose of the study is to assess the degree to which the explanatory variables affect the response variable and determine whether a positive, negative or no impact exists between these variables. The study uses a regression model using the OLS method to conclude the results from the available data. The findings suggest that average daily wages and rural population have a negative relationship with the employment rates. Increase in employment rates with an increase in daily wages can be tackled by introducing subsidy schemes for employers so that they can hire more workers. Since there is also a mismatch between the skills required by the employers and the skills the workers have, it is also recommended to enhance initiatives like Skill India with a special focus given to rural population. To become a developed country, India has to focus on methods of increasing the participation rate of women in the labour force and a need for stronger institutions.

**Keywords:** Employment rates, wages, population, literacy rate

## Introduction

The relationship between daily wages and employment has been a subject of discussion in labour economics for a long time. Historically, it is believed that wages play a significant role in influencing employment rates. However, in most recent studies, it is said that daily wages have small to no effect on employment rates. Average daily wages is the calculation of a labourer's average daily earnings. In India, different states have set different daily wages that is equal to or above the minimum wage levels. With nearly 65% of India's population living in rural India, it is important to study whether wages affect rural employment rates. In the short-run, wage increase can help the household achieve better income and standard of living, however, with greater hikes, it is said to have a reverse trend. In the long-run an increase in wages will only lead to an increase in prices with no actual increase in employment rates as the employment rate will be at its natural level.

According to NSS quinquennial surveys, there is a decline in agricultural employment (mainly rural employment) and an increase in non-rural employment. This shift is expected in developing economies. However, India is witnessing a slower transition from agriculture to diverse sectors, with the rural population in 2022 declining by just 0.06% from the previous year. This shift is even slower in rural India. Understanding the relationship between wages and rural employment can enhance rural livelihood and help in the implementation of better policies. The rural labour market also experiences seasonal employment, informal work, disguise employment and self-employment, hence, it is essential to develop solutions for these problems.

In the present scenario, focus on wages and employment is crucial for India to emerge as a developed nation. Average daily wages in India have shown an upward trend but the wages are still lower than in urban areas leading to economic disparities. The enforcement of minimum wages is weak as workers continue to receive wages below the minimum levels and often find themselves employed in informal sectors.

The research gap is that no papers were published on the same/similar topics in recent years pertaining to the Indian context. Most studies focus on minimum wage hikes and their impact with no special focus on rural employment. Therefore, this paper attempts to study the effect of rural employment rate with change in average daily wages. This paper aims to find out a comprehensive analysis of wages and employment in rural areas of different states of India.

The effect of average daily wages (the key explanatory variable) on employment rates (dependent variable) and the dynamics between these two variables will occupy most part of this paper. Additionally, explanatory variables literacy rates and rural population of each state will be used to help in better understanding of the strength and direction of the variables.

The paper further briefly explains the theoretical and empirical review of the literature in the second section. The third section covers data and methodology. The fourth section covers results and discussions followed by conclusion in the sixth section.

## Hypothesis of the study

**$H_0$:** There is no impact of average daily wages on employment rates

**$H_a$:** There is an impact (either positive or negative) of average daily wages on employment rates

## Literature Review

### Theoretical Studies

According to John Maynard Keynes, employment was mainly determined by aggregate demand. According to his view, higher wages can increase the purchasing power of individuals leading to greater employment. However, he also noticed that the wages do not adjust easily and it can lead to unemployment if employers reduce labour to compensate for higher wages.

Milton Friedman argued that wage increase would lead to an increase in prices(inflation) with no improvement in employment as both employment and unemployment would remain at natural rates. He also argued that higher minimum wages would affect low-skilled workers as job finding becomes more difficult with increased wages.

**Empirical Studies**

Erlend Berg, S. Bhattacharyya, R. Durgam, and M. Ramachandra [2012] [5], found in their study how the National Rural Employment Guarantee scheme by the Government of India increased the daily average agricultural wages by 5.3%. This wage increase effect is gender-neutral and biased towards unskilled labour.

N. Nagaraj, C. Bantilan, L. Pandey, and N. Roy [2016] [3], found in their study that MGNREGA led to an increase in both farm and non-farm wages with an increase of up to 3 times in some areas though there was half as much increase in MGNREGA wages. The study also found out that there was a decline in male agricultural labourers and an increase in the female working force thereby witnessing a "Feminised Agriculture". The decline of the male labour force led to a shortage of labour. The study also recommends improving rural mechanization through skill development programs, especially for females.

Anil K. Bhargava [2014] [4], in his study, used difference-in-difference and regression discontinuity to test the results and found that an increase in wages by 3-5% in rural areas prompted land-owners to use labour-saving technologies and in the long run, NREGA would increase productivity and lead to higher wages for labourers but with reduced labour force.

This paper explores the relationship between average daily wages and employment rates. In this study, the dependent variable is the employment rate measured using Worker Population Ratio (WPR) and the independent variable is the Average Daily Wage measured in terms of Rupees. Other independent variables include literacy rate measured in terms of percentage and rural population in terms of numbers of different states and union territories in India.

WPR indicates the percentage of the population that is employed, rural population is the population living in rural areas as defined by NSO, and Literacy rate measures the proportion of the population that is literate for five years and above. The relation which the paper is trying to find out is as follows:

Employment rate = f (average daily wage, literacy rate, rural population)

**Employment rate and average daily wages:** As wages increase, the cost of labour goes up, and employers cannot afford to match the high wages. In order to compensate for high wages, employers cut down the number of hired workers. Looking from the perspective of labour supply, there is also a trade-off between hours of work and leisure. As the wage rate increases, the backward bending of the labour supply curve indicates that people prefer more leisure than work as the income effect outweighs the substitution effect. In the case of rural areas, we notice that when the money wages increases, the farm owners, landlords and small-scale unit manufacturing owners try to reduce the labour in order to account for higher production costs. Hence the employment rates go down as wages increase and labourers are often engaged in seasonal/disguised employment which is evident in rural areas.

**Employment rate and literacy rate:** The role of education on employment rates and economic growth is important. The general relationship between literacy rate and employment is positive, as literacy rate increases, employment should also increase.

**Employment rate and rural population:** Employment rates largely depend on the population. A higher population represents a larger labour force and leads to more potential workers. But if the job creation doesn't keep up with the pace of population growth, then it would lead to unemployment.

**Data and Methodology**

The study is based on cross-sectional data and focuses on the financial year 2022-23. This year was chosen as it is relevant to study the trends in present times(post-covid). The study comprises data from 34 Indian states and Union Territories for the financial year 2022-23.

The average daily wage data is collected from the Ministry of Rural Development, the employment rate is measured using Worker Population Ratio (WPR) and literacy rate is extracted from the Annual Periodic Labour Force Survey (PLFS) Report 2022-23 and the rural population dataset is sourced from Reserve Bank of India (RBI).

The study represents the Worker Population Ratio as a proxy variable of the dependent variable-employment rate. The explanatory variables include average daily wages measured in terms of Rupee and Rural population measured in numbers

This paper uses a regression model using the ordinary least square method to understand how literacy rate along with other explanatory variables affect the employment rates in rural India. Further various tests like BP, GQ tests are used to check the presence of heteroskedasticity among the variables, VIF model is used to check if there is presence of multicollinearity.

The regression model is as follows:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + u_i}$$

Where,

Y is employment rates, X1, X2, X3 are average daily wages, rural population and literacy rates respectively.

**Table 1:** Variables used in this study

| Variables | Measurement unit of proxy variables | Dependent/Independent Variables |
|---|---|---|
| A Average Daily Wages | Rupee | Independent variable |
| Literacy Rate | In percentage | Independent variable |
| Rural Population | In numbers | Independent variable |
| Employment Rates | In terms of WPR in percentage | Dependent variable |

## Results and Discussions

### Test for CLRM Assumptions

#### 1. Test for heteroskedasticity

Heteroskedasticity indicates that the variance of the data is not same for all observations.

**H0:** There is homoscedasticity

**Ha:** There is heteroskedasticity

BP and GQ tests were conducted to check the presence of heteroskedasticity**.**

**BP = 5.1788, df = 4, p-value = 0.2694**

**GQ = 1.4662, df1 = 22, df2 = 21, p-value = 0.1923**

In both tests, the p-value is less than 0.05 which indicates that null hypothesis cannot be rejected. This indicates the absence of heteroskedasticity.

#### 2. Test for multicollinearity

Multicollinearity is one of the violations of OLS which indicates that the independent variables are correlated with each other. The variance inflation factor (VIF) model is used to check the presence of multicollinearity.

**Table 2:** VIF values lesser than three indicate that there is no multicollinearity. The independent variables used in this study show no multicollinearity which otherwise would violate the OLS method of regression

| Average daily wages | Literacy Rates | Rural Population |
|---|---|---|
| 1.146895 | 1.525564 | 1.634047 |

#### 3. Other tests

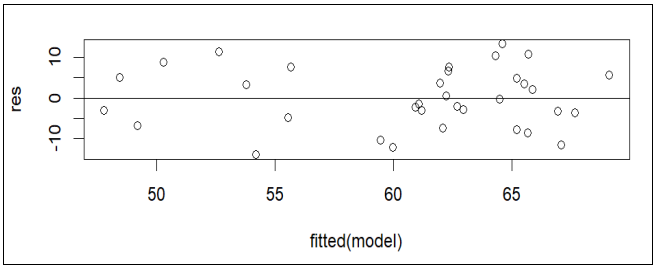


**Fig 1:** Residual Plot: A scattered residual plot indicates that the linear model is an approximate model

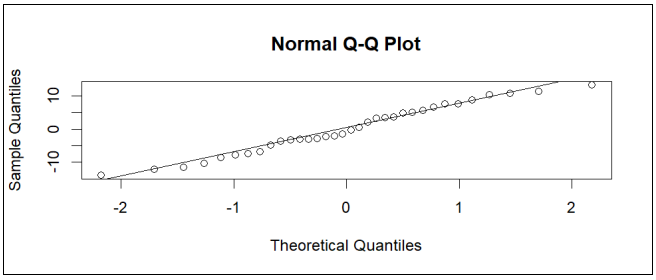


**Fig 2:** Q-Q plot: Points on the 45-degree line indicate that the residuals are normally distributed

### Results of OLS regression

**Table 3**: Summary of regression model

| Residual standard error: 7.705 on 30 degrees | Multiple R-squared: | Adjusted R-squared: | F-statistic: | p-value: |
|---|---|---|---|---|
| of freedom | 0.3961, | 0.3357 | 6.559 on 3 and 30 DF | 0.001527 |

**Table 4:** Summary of regression model

| | Estimate | Std. Error | t value | *P value* |
|---|---|---|---|---|
| Intercept | 110.9 | 17.93 | 6.184 | 8.34e-07 *** |
| Average daily wages | -0.1562 | 0.003888 | -4.107 | 0.000364 *** |
| Rural Population | -0.00089 | 0.00005018 | -1.790 | 0.083613. |
| Literacy Rate | -0.1346 | 0.2087 | -0.645 | 0.523698 |

For each unit increase in average daily wages, the employment rate decreases by a factor of 0.1562, for each unit increase in rural population, the employment rate decreases by 0.0089 percent, for each unit increase in percentage of literacy rate, employment rate decreases by 0.1346. percent. $\beta_0$ = 110.9 is the predicted value of the employment rate when all the other independent variables are considered to be zero. Average daily wages, rural population and literacy rate has a negative impact on employment rates.

As the average daily wages is increasing in rural areas the employment rate is decreasing, this can be because of several factors.

- When wages increase, employers tend to reduce the number of workers to maintain profit margins.
- As wages increase, there is a sectoral shift from agriculture to small-scale manufacturing units. Wage increase creates a demand for high skilled workers, since rural areas lacks the necessary skills, the employment rates decline.
- Additionally, when daily wages increase, employers may invest in machinery rather than spending on labour force

As population increases, there is very less negative impact on employment rates.

- As the population increases, the need for basic facilities like food, shelter, education and clothing rises. The government has to make a greater effort with respect to the progress of growth.
- A rapidly growing population poses a greater economic burden for a developing economy. A rising population leads to an increase in the labour force which leads to a higher supply of labour than demanded leading to unemployment.
- Rural areas are heavily dependent on agriculture or low-wage jobs which doesn't attract any migrant workers and competition for employment persists within the villages. Since nearly 65% of India's rural population resides in villages, the competition for daily wage jobs increases as the population increases.

The study also claims that the relation between employment and literacy rate is inversely related. The following reasons can be justified

- An increase in wages of a literate person need not necessarily have a significant impact on employability. Since rural areas are highly dependent on low-skilled

labour, a high literacy rate need not necessarily mean increase in employment opportunities.
- In some parts of India, evidence of younger generation dropping out from high school or secondary high school to support their family in traditional activities still persists. These people are accounted as literate people but do not actually work and instead continue family businesses.
- If a significant proportion of the population lack basic literacy skills, they are less likely to qualify for jobs that involve written, technical skills etc.

From the p-value from table 4, we can also conclude the following:
- The p-value for average daily wages is 0.000364. Since p-value is less than 0.001, we can conclude that null hypothesis of the study is rejected at 99.9% confidence level and alternative hypothesis is accepted. This means that average daily wages has a very strong negative relation with the employment rate.
- The p-value for rural population is 0.083613. Since p-value is less than 0.1, we can conclude that the null hypothesis of the study is rejected at 90% confidence level. This means that there is a marginal negative impact of population on employment rate.
- The p-value for literacy rate is 0.523698. Based on p-value we cannot reject the null hypothesis indicating that literacy rate has no impact on employment rates for our model of the study. There is no strong evidence that literacy rate impacts the outcome of this model.

From table 3, we can conclude that the overall p value is 0.001527 which tells that the null hypothesis is rejected and alternate hypothesis is accepted which means that the overall model where at least one of the independent variable contributes significantly in explaining variance in the dependent variable, i.e. employment rate. Further the table also tells that 39.6% of the variance in employment rate is explained by the set of independent variables used in the study.

## Conclusion

India is a country where there are significant economic disparities between rural and urban areas. Understanding whether average daily wages affect employment rates can help in targeting better policies. Further it draws a need for intervention by the government to analyse in-depth rural aspects. In a country where more than half of the population depends on agriculture and other informal activities, understanding how wages affect employment rates is crucial for analysing government schemes like Make in India and Skill India. Also analysing the relation between these variables helps in better implementation of minimum wages and better protection for workers earning below minimum wages.

The findings from the regression results indicate a strong negative relationship exists between average daily wages and employment rates. The overall model is statistically significant, indicating that the explanatory variables give meaningful insights into the dependent variable. Further 39.61% of the variance in the response variable is explained by the predictors.

## Policy implications

- Adjusting minimum wage policies should be considered because each state has different demography, rural population, types of workers based on which the wages should be set so that they can achieve better employment rates and improve the standard of living of the rural population.
- Policymakers should carefully analyze the labour-market conditions before implementing wage increase.
- Various subsidy schemes should be implemented so that employers can hire more workers while keeping up with the higher daily wage rates.
- Skill development initiatives with a special focus on rural people should be prioritized so that rural population can be integrated into the mainstream of the working population. Investment in training and education helps in enhancing the skills of the labour force making them more suitable for the type of jobs demanded.

## Limitations

Since this paper uses cross-sectional data, the trends that evolve in the long-run cannot be studied. Various other relevant variables useful for the study of employment rates are not considered in this paper. Other broader economic situations like recession in the economy, or the pandemic effects are beyond the scope of this paper.

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