



## Economic and climate impact on MGNREGA participation rate in Karnataka

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### Abstract

The agriculture is directly and climate is indirectly influenced on the un-employment in rural area but changes in climate could significantly impact on agriculture. The cross section data has been used from 2006-2017. The study has measured simple linear regression analysis to quantify the impact of Agriculture, Climate, and Economic variables on employment demanded labors in MGNREGA. The economic and agriculture parameters are positively influence on MGNREGA but not gross irrigated area. But the interaction term of climate and fertilizer in irrigated and un-irrigated area reduce the labour shift from agriculture to other activity and vice versa. The crop diversification significantly negative impact on participation rate of MGNREGA. So, labors are concentrated in both areas for work.

**Keywords:** CEI, Crop diversification, and MGNREGA

### Introduction

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is a one of the employments generating programme to bring forward of rural labors. In this context schemes for rural development and livelihood programmes are very relevant to end poverty, achieve gender equality through empowering all women with promote sustained & economic growth, full & productive employment for end hunger are also Sustainable Development Goals of Rio+20. A vast majority of the works under the MGNREGA are linked to land or soil and water, agriculture, increasing forest area, Swachha Bharat Mission and etc... After an implementation of mechanization, technology, modern agriculture system, and some who are loosed their agriculture land from industrialization, and construction activities those agriculture land owners and labors are suffered from the works and employment to lead the life are comes under the range of unemployment. For those rural workers central government has announced the programme of MGNREGA.

### Literature reviews

The studies are most helpful to know the effective work for implementation of the policies and programmes for increasing life style, empowering the women with the help of providing work, training and giving the awareness. Agriculture is a labour intensive sector, labour cost is a one of the major part of total cost of agriculture produce is also becoming a big problem. So, MGNREGA also works in agriculture. MGNREGA is helping to provide employment to the rural poor but it also creating the problem of availability of labour for the agricultural sector (Pushpa S, 2014) <sup>[1]</sup>. In the agriculture and construction participation rate of worker are less likely to work MGNREGA compared unemployed population. The participation rate of women in MGNREGA is increased more than males (Navtez S, 2018) <sup>[2]</sup>. The agriculture labour scarcity will increase wages, lead to rise in cost of production are happened due to increase in

the wages of non-agriculture and MGNREGA will makes labor shift. But those labor shift happens even in less wage rate or in under employment when the agriculture also creating unemployment by usage of fertilizer, pesticides, technology, and modern method of agriculture with less labor. So, to bring forward MGNREGA focusing on the rural poor, old-age people, disable, women and children related programmes implementation for increasing the socio-economic condition and getting the equality between the genders (MWCD, Govt of India, Annual report 2006-07). MGNREGA is significantly impact on rural poor, with increasing job cards and bank accounts are increases the income level and savings level (Rukmins, 2015). The MGNREGA is adversely affected to agriculture, will reduce the productivity and prices (T. Basu, 2015 and Deepak V *et al*, 2015). The wage of agriculture is increasing after an implementation of MGNREGA and reduced the wage gap between men and women. It also decreased the labor force affects to farm operations (D. Narasimha R, 2014) <sup>[4]</sup>.

And the poorer households in MGNREGA through capacity building, self-help groups etc. are helps to empower the rural poor (Dr. C. Dheeraja *et al*, 2013). It was explains the women's decision taking capacity, participation in community association, contribution to family expenditure, spending capacity and creation of community assets and associations are increased (D Bharati *et al*, 2008) <sup>[8]</sup>. Most of studies are conducted to know the impact of MGNREGA on workers in National and State level but no-one has concentrated on agriculture side in the contribution of unemployment on the basis of Agriculture, Climate, and Economic variables.

The National Rural Employment Guarantee Act came on 7-Sep-2005 (NREGA) and was renamed as Mahatma Gandhi National Rural Employment Guarantee Act 2009 (MGNREGA) implemented for providing the employment facilities to the rural poor but it's not applied to the Purasabhe. In beginning the programme was implemented in 02-02-2006 to give 100 days' guarantee work in selected

200 districts but percent its covers all over India and targeted to 150 days or if work is need in the area of drought prone. There are two major issues occurs to implementing the MGNREGA wage rates because the minimum wage rate was determined by state but NREGA wages are fixed by Central Govt. may be notified the wage rate for the purpose of NREGA minimum wages act 11 of 1948. The state and central govt. are conflict because central govt. fixed minimum wage rate is more than the state govt. minimum wage rate. And central govt. linked the wage rates to the CPI-AL. Now the MGNREGA wage rates are fixed by Rural development Ministry as per the 6 (1) of the NREGA Act. The implementation of MGNREGA was left to the Grama Panchayats. The minimum wage rate initially determined to 100 rupees per a day but after it is revised to keeping state labor employment convections. Starting in 2005-06 minimum wage rates was 63 rupees, at present (2017) it is 236 rupees it will increase as much as increasing in inflation rate. Currently the wages are differing between states, the highest wage rate of 277 rupees was provided by Haryana state. Totally reserved 38,500 crore in 2016-17 and the scheme has been increased 4%. For this 48,000 crore was allocated at present budget. But also it has many problems.

Different states and districts are faces many problems in MGNREGA, it is the substitute work for the rural people when they didn't get work in an agriculture and other activity. Because in before implementation of technology and mechanization, human labour are played a major role in agriculture due to we don't have as much as related agriculture machines at the time. This will leads automatically the rural employment was high but after entering the machineries into agriculture the rural employment was fall down, for compensating this govt. was initiated MGNREGA and other employment generation programmes to reduce the poverty and unemployment in rural area. If the government didn't provide work, the socio-economic condition of worker will fall down compare to after implementation of technology and mechanization. But before that the situation is good means they are in the Agriculture and allied activities.

This employment and unemployment ratios are differ from irrigated and unirrigated area. In the rural area most of the households or people are depending upon agriculture and allied activities but they were suffering from unemployment in summer because of no works in agriculture. Providing 100 days of work to every rural household whom volunteer to do unskilled manual work. At present it entirely covers all over India except urban population. More than the 65% of the work was done under the MGNREGA was linked to Agriculture and Allied activities. The main aim of the program is to reducing the unemployment and poverty with providing an employment, so it's mainly implemented in rural area. In the rural area for almost works wage rate was differ between men and women because the people are think difference in working ability or capacity but they are specialized in some works. So for keeping the equality in between men and women with providing the equal wage rate is good decision of the govt. for empowering the women and it is necessary to increase socio-economic condition of women's. This is the most favorable program for rural unemployer's and unskilled when drought may or may not be occurs. Because of the increasing wage rate trends and pattern of MGNREGA from 2006-17 was high

than agriculture wage rate was given to women but it's lesser than men's agriculture wage. After getting the MGNREGA work socio-economic condition of the family is increasing of Disable, old-age people, and unskilled, and some are normal as like before working in agriculture and allied activities. Because of reduction in number working days in agriculture, and due to inflation, the present wage rate is fulfils the needs of people and that is fulfils their problems as much as increasing wage rates. Due to this, they will earn more in agriculture than MGNREGA when they are taken (or worked in) lease of agriculture works. MGNREGA was most helpful to reduce the migration level from rural to urban with providence of employment to un-employment and makes lead a life.

### Data and Methodology

The study has been conducted by considering district level cross sectional data of Karnataka from 2006-07 to 2017-18. The study covered rural unemployed labors applied for providing job-cards in MGNREGA. The agriculture, climate, and economic data are used to analyze the impact on MGNREGA labors participation rate. The data is collected from [mgnrega.gov.in](http://mgnrega.gov.in), Agriculture statistics, Metrological department, and state annual report. It will assess the economic impact to lead their life or family. Simple linear regression has been used to analyze the effect of modern agriculture system and developing agriculture activities on participation of labor in MGNREGA and the generation of unemployment in Karnataka.

### Estimation

$y = X\beta + \varepsilon$	Equation 1
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Model given in Equation 1 is estimated with data pooled over time. Dependent Variable 'y' is the total employment demanded households for job cards (*ln TEDHHJC*) in MGNREGA and 'X' is the vector of independent variables as described above. 'β' is the parameter vector and 'ε' is the error term. Given the panel nature of the data, heteroscedasticity is to be expected. Estimation is done by least squares estimator with heteroscedasticity consistent Whites estimates for co-variances. Model diagnostics such as normality tests, autocorrelation tests were calculated. Multicollinearity was diagnosed using Variance Inflation Factors (VIFs). VIF value greater than 10 is an indicator of multicollinearity. Estimation was done in SAS using Base SAS.

The study has used Climate, Agriculture, and Economic variables to analyze the impact on MGNREGA workers or it has been assumed as the rural unemployment rate. It is considered before the implementation of mechanization in agriculture. This MGNREGA workers has been considered as 'y' variable and remaining factors of independent variables 'x' are; area not available for production (*lnNAC*) is highest in Ballari (163768 hectares) in last five years and followed by Tumakuru (157602 hectares), Bengaluru Urban (130053) and lowest exist in Gadag (22109). Other uncultivated land excluding fallow land (*lnOUCLEFL*) is more found in Shivamogga district (206642 hectares) followed by Tumakuru and Chikkamagaluru but lowest also exist in Gadag (3866 hectares). The fallow land (*lnFL*) exist in Raichuru (273804 hectares) followed by Tumakuru (233533) and lowest in Kodagu (12131). The highest gross

Irrigated area (*lnSWGIA*) found in Belagavi (531587 hectares) followed by Ballari (239002) and lowest in Kodagu (1510). The GDDP percapita income (*lnPCI*) is maximum in Bengaluru (370003 rupees) followed by Dakshina Kannada (274602) and minimum found in Yadagiri (81845). The Crop Production (*lnP*) is highest in Tumakuru (19511444.6 qtl) followed by Chikkaballapura (17735048) and lowest found in Kodagu (92395). The cloud cover (*lnCCO*) is very high in Chmarajanagara (50.88 percent) followed by Mysuru (49.79) and lowest exist in Shivamogga (34.88). The wet day frequency (*lnWDF*) is more in Hasana (8.34 hecta-pascal) followed by Chikkamagaluru (8.22) and less in Raichuru (3.31). The potential evapotranspiration (*lnPE*) is highest in Bidar (6.73) followed by Kalaburgi (6.72) and lowest in Shivamogga (4.48). The temperature (*lnAvTEMP*) is max in Ballari (28.41°C) followed by Dakshina Kannada (28.31) and lowest in Kodagu (23.85). The rainfall (*lnRain*) is highest in Udupi (3411.3) followed by Dakshina Kannada (2920.8mm) and lowest in Chitradurga (327.13mm). The fertilizer consumption (*FC*) is state average, the min kg of per hectare is 119 and max is 184. The larger value of Crop Entropy Index (*CEI*) found in Bengaluru urban (0.753) and lower in Udupi (0.301). And the Minimum wage rate in MGREGA (*Wage*) was 224 rupees is highest and 69 is lowest. The above mentioned data are given as recorded in 2016.

### Results and Discussion

Output of the results from the equation of regression is presented in the table 2. Result of the model indicates that, the parameter estimate on the variable *lnNAC* is negative and statistically insignificant. The other uncultivated land has not been included in the fallow land (*lnOUCLEFL*) parameter value is  $P < 0.0003$ , and the fallow land (*lnFL*) are positive and statistically significant ( $P < 0.0001$ ). Because of heavy usage of fertilizers, production of single crop continuously make farm land unproductive, urbanization, industrialization, and usage of technology etc. will cause to shift of agriculture labour to MGNREGA or other activities. The gross irrigated area (*lnSWGIA*) is negative and statistically significant ( $P < 0.0001$ ). It will reduce the participation of labor in MGNREGA with providing work in agriculture area. The amount of wage rate of MGNREGA (*Wage*) is statistically significant and positive ( $P < 0.0001$ ) due to as increasing rate of wage will increase the participation, also it is more than the agriculture daily wage rate. And it will increase the per capita income (*lnPCI*) is also positive and fairly significant ( $P < 0.0214$ ). The provision of MGNREGA work when not available of agriculture work (in summer), and in the available of agriculture work (for disable, unskilled, old-age people) participation will give high income than only in the working condition of agriculture and the low agriculture wages will make agriculture labour to shift in MGNREGA work. It is also provides the work to unskilled, Old-age people, disable, etc. will positively impacts to lead the life and change the life style. The production of crop (*lnP*) and temperature (*lnAvTEMP*) are positive and cloud cover (*lnCCO*) and rainfall (*lnRain*) are negative but both are statistically insignificant.

All these factors are not pushed the rural people to unemployment but the government policies and

programmes for to increase the income of agriculture farmers has taken many steps such as usage of mechanization in agriculture for preparing land, planting, digging, application of pesticides, usage of drones, etc. and adopting modern methods and technologies will occupies the works of agriculture labors. The changes, innovations, and adaptations of modern agriculture, machinery, and technology will make farmer better-off and labor worse-off. It will reduces the cost of farmers and brings high production will make farmer profitable but worker will suffer to lead the life. This had made a government to create MGNREGA program for providing the works to rural unemployed.

The study has also used climate and agriculture data to check the effect of agriculture on unemployment generation in rural area and that rate of unemployment is converted as employment from MGNREGA. In the estimation of the study; fertilizer consumption and rainfall (*RGIAF*) interaction term in gross irrigated area from the different sources, rainfall and fertilizer consumption (*RF*) interaction in dry land agriculture, and the parameter of cloud cover, rainfall, and wet day frequency (*CRW*) interaction terms are creates statistically significant ( $P < 0.0001$ ) and negative effects to MGNREGA participation rate but for the agriculture it is productive effect. The rainfall and fertilizer interaction increase the speed of crop growth to get output early. Parameter of *CRW* increases the area of irrigation will reduce the participation rae in MGNREGA. Other than, in less rainfall region consumption or utilization of fertilizer (*FC*) is statistically significant ( $P < 0.0001$ ) but negative effect will reduce the MGNREGA participation rate with increasing agriculture productivity.

And finally these effects of climate will bring less production in agriculture due to change in climate causes to less income will makes crop shift, crop mix and crop diversification. This crop diversification is also found by estimating Crop Entropy Index (*lnCEI*) among the districts of Karnataka creates significantly negative ( $P < 0.0195$ ) effects on participation in MGNREGA, it means workers are shifting other than MGNREGA. For ex: Men workers participation also decreasing in MGNREGA due less wage rate. It will make farmers to get high income in another way of adopting the allied activities of agriculture or also selling the land to urbanization or/and to industrialization will occupy the works. But it harshly effects on the agriculture labors to get job in those industry or urban area due to they are unskilled. It will make them to be un-employ. The temperature (*lnAvTEMP*) is statistically insignificant but positively correlated because of increase in temperature creates dryland with increasing potential evapotranspiration (*lnPE*) is statistically significant ( $P < 0.0002$ ), it will reduce the area of cultivation will rises the unemployment to agriculture labors and pushes to participate in MGNREGA. In overall the MGNREGA will reduce the labor participation rate in Agriculture and voice versa. So, the labors are participating in both areas.

The study has not quantified the modern agriculture system due to its not quantifiable. And the usage of mechanization and technology will play a vital role in the creation of unemployment in primary sector but usage of machinery and new technology data has not available. So, the adaptation of modern agriculture, machinery, and technology are the main limitations of the study.

## Conclusion

Study has calculated regression on unemployment rate in rural area with the help of agriculture, climate, and economic data to explain the impact of variables. The consumption of fertilizer interaction with rainfall in dry zone and interaction in irrigated area, and also cloud cover, rainfall, and humidity will bring positive effect on labor participation in agriculture. An increase in area of uncultivated land, fallow land, wage, and percapita income are positively correlated to MGNREGA in workers participation rate. The changes in crop area to uncultivated will impact on the rate of unemployment, is highly influenced to labor diversification. So, those negative effect to agriculture will helps to formulate policy and programmes. It will make labour to move on with MGNREGA for leading a life as increase in wage rate for increase the income for their necessary life. And the MGNREGA is significantly impact on socio-economic condition of Old-age, disable, and women workers with providing work, creating awareness, building the equality will bring them in front of society.

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