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Impact of MGNREGA on Input-use Pattern, Labour Productivity and Returns of Selected Crops in Gulbarga District, Karnataka[§]

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Abstract

The study has tried to capture the effect of MGNREGA by selecting two sets of villages in the Gulbarga district of Karnataka, one which have utilized 75 per cent of allocated funds and the other which have utilized less the 25 per cent of allocated funds under MGNREGA. The study is based on primary data obtained from 120 sample farmers belonging to five village panchayats. In redgram, a significant difference has been observed in use of machine power and labour use between fully and partially-implemented MGNREGA villages, but no difference has been recorded in the use of material inputs. Similarly, in the *rabi jowar*, there is a significant difference in labour use but not in the use of machine power and material inputs between two categories of villages. The total cost of cultivation in fully-implemented MGNREGA villages has been found higher by 22.91 per cent and 16.37 per cent in red gram and *rabi jowar*, respectively. The labour productivity of male and female has been noticed lower in fully-implemented MGNREGA villages for all operations in both the crops. The study has given some suggestions to address the problem of labour scarcity in fully-implemented villages.

Key words: Impact of MGNREGA, Input-use pattern, Labour productivity, Crop returns

JEL Classification: J43, J24

Introduction

In India, despite a robust economic growth, poverty and unemployment continue to be the major economic problems with 75 per cent of the rural population living below poverty line and 74 per cent unemployed population hailing from rural India (Sanyal, 2011). In order to address poverty effectively through provision of wage employment, the Government of India (GOI) formulated the National Rural Employment Guarantee

Act (NREGA) in the year 2005 which was later renamed as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). Its main objective is to enhance the livelihood security of people in the rural areas by guaranteeing 100 days of wage employment in a financial year to a rural household who volunteers to do unskilled manual work. MGNREGA provides employment to those who demand work. It is an exclusive feature; this differentiates it from routine schemes. In the first phase, it was introduced in 200 districts but in April 2008, it was extended to all the rural areas of the country (Jeyashree, 2010).

With the implementation of MGNREGA there is an apprehension among the farmers about the shortage of labour for agricultural operations making farming

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difficult resulting an increase in the cost of crop cultivation. It is also a fact that the number of labourers engaged in agricultural operations has decreased. Therefore, the present study was undertaken to assess the impact of MGNREGA on the changes in input-use pattern, labour-use pattern, labour productivity, cost of cultivation and returns from crops after the implementation of the scheme in the Gulbarga district of Karnataka.

Methodology

The study was carried out in the Gulbarga district purposively as it has utilized the maximum funds in the state under MGNREGA for the financial year 2009-10. Gulbarga is one among the backward district in Hyderabad-Karnataka region, besides being a typical rainfed area. Redgram is the major pulse crop and it is called as '*Tur Bowl*' of the state. *Jowar* and chick pea are the other main food crops grown in the district.

The study was based on the primary data collected from the sample farmers through personal interview method. A multistage sampling procedure was adopted for the selection of sample farmers. In the first stage, Gulbarga district which was covered under the first phase of the Act and had utilized maximum funds under the MGNREGA Scheme was selected. In the second stage, five village panchayats, Sannur, Yedrami, Atanoor, Degalmaddi and Hiroli belonging to Gulbarga, Jevargi, Afzalpur, Chincholi and Aland taluks, respectively were selected based on the amount of funds utilized and number of people employed in the Scheme. In the third stage, four panchayats which had utilized more than 75 per cent of the allotted funds (termed as fully-implemented) under the Scheme and one panchayat which had utilized less than 25 per cent of the allotted funds (termed as partially-implemented) were identified. One village each from four fully-implemented panchayats was selected based on the amount of funds utilized and the extent of employment generated in the programme. Finally, 15 sample farmers each from four villages of fully-implemented panchayats and 20 sample farmers each from three villages from partially-implemented panchayat were selected. Thus, 120 sample farmers, 60 from fully-implemented and 60 from partially-implemented panchayats were interviewed.

Fisher's t-test was used to analyze the significant difference in input-use, labour-use pattern, cost of cultivation and returns from crops between fully- and

partially-implemented villages. The labour productivity was computed by considering the ratio of prevailing wage rates paid per day (men and women) to the duration work expressed in rupees per hour. Higher the wage rates, lower was the labour productivity and vice versa.

Results and Discussion

Material Inputs-use Pattern in Redgram and *Rabi Jowar*

For redgram, farmers in the partially-implemented MGNREGA villages had used marginally more seeds (4.29 kg/acre) as compared to the farmers of fully-implemented MGNREGA village (4.19 kg/acre) (Table 1). Farmers of both fully- and partially-implemented MGNREGA villages had used more than the recommended dosage of redgram seeds (4 kg/acre) and had treated them with rhizobium and trichoderma.

The farmers in fully-implemented MGNREGA villages had applied lesser organic manure in redgram compared to partially-implemented MGNREGA villages but the difference was statistically non-significant. The higher livestock population in the partially-implemented MGNREGA villages facilitated higher application of organic manure.

The application of both phosphatic and nitrogenous fertilizers was significantly higher in fully-implemented than partially-implemented MGNREGA villages (Table 1). However, the application of chemical fertilizers in both fully- and partially-implemented MGNREGA villages was lower than the recommended dose of fertilizers in redgram (25:50:0/NPK) due to risk in getting back the returns due to uncertainty in weather. Higher quantities of organic manure application in the partially-implemented MGNREGA villages resulted in lower chemical fertilizer application in comparison with fully-implemented MGNREGA villages.

The farmers in partially-implemented MGNREGA villages had used significantly more chemical pesticide, i.e. active ingredient (21.34 mL/g/acre) compared to fully-implemented MGNREGA village farmers (16.70 mL/g/acre) for effective control of pest and diseases. The farmers in fully-implemented MGNREGA villages applied weedicide (3.15 mL/acre) in redgram because of higher cost of manual weeding in comparison with partially-implemented MGNREGA villages. The

Table 1. Input-use pattern of redgram and *rabi jowar* in fully- and partially-implemented MGNREGA villages in Gulbarga district

Particulars	Partially-implemented villages	Fully-implemented villages	Mean difference	't'-value
(per acre)				
Redgram				
Seeds (kg)	4.29	4.19	0.10	0.88 ^{NS}
Seed treatment				
a. Rhizobium (gram)	4.21	4.78	0.57	0.19 ^{NS}
b. Trichoderma (gram)	3.25	3.62	0.37	0.16 ^{NS}
FYM (tonne)	0.14	0.11	0.03	0.30 ^{NS}
Chemical fertilizers				
a. Nitrogen (kg)	7.93	9.36	1.43	1.49 ^{NS}
b. Phosphorous (kg)	15.19	18.35	3.16	2.78*
Weedicide (mL)	0	3.15	3.15	1.36 ^{NS}
Growth hormone (mL)	0	6.86	6.86	3.17*
Chemical pesticides (a.i) (mL)	21.34	16.70	4.64	2.49*
Rabi jowar				
Seeds (kg)	4.27	4.54	0.27	1.91 ^{NS}
FYM (tonne)	0.05	0.04	0.008	0.10 ^{NS}
Chemical fertilizers				
a. Nitrogen (kg)	8.73	10.23	1.5	0.73 ^{NS}
b. Phosphorous (kg)	5.52	7.55	2.03	1.18 ^{NS}

Notes: * Significant at 5 per cent level

NS-Non-significant

Fully-implemented villages: Villages which have utilized more than 75 per cent of allocated funds under MGNREGA.

Partially-implemented village: Villages which have utilized less than 25 per cent of allocated funds under MGNREGA.

prevailing wage rates were higher in fully-implemented than partially-implemented MGNREGA villages. The findings of the study are in contradiction with those of Gladson (2008), who reported that the intercultural operation under the integrated pest management was manual. Due to labour scarcity, farmers had opted use of pesticides and herbicides, which was ecologically undesirable, besides driving up the input costs. Some farmers in fully-implemented MGNREGA villages had also applied growth hormones (6.86 mL/acre) for better flower initiation and pod setting in redgram which was not followed in partially-implemented MGNREGA villages. The difference in the use of growth hormones was significant and non-significant for weedicides between fully and partially-implemented MGNREGA villages.

In the *rabi jowar*, the input-use pattern by fully and partially-implemented MGNREGA villages with

respect to material inputs seeds, FYM and chemicals fertilizers was found to be statistically non-significant. The seeds used by farmers were lower in the partially-implemented (4.27 kg/acre) than fully-implemented (4.54 kg/acre) MGNREGA villages. However, both had used more than the recommended dosage of seeds (3 kg/acre). In the *rabi jowar*, FYM application was marginally higher in partially-implemented than fully-implemented MGNREGA villages. The livestock population was higher in partially-implemented MGNREGA villages resulting in higher organic manure application in comparison with fully-implemented MGNREGA villages. The chemical fertilizers application, viz. nitrogen and phosphorous was higher in fully-implemented than partially-implemented MGNREGA villages (Table 1). The chemical fertilizers application in both fully and partially-implemented MGNREGA villages was lower than the recommended dose of fertilizers in the *rabi jowar* (50:25:0/) because

Table 2. Labour-use pattern in redgram and *rabi jowar* in fully and partially- implemented MGNREGA villages in Gulbarga District

	(per acre)		
Particulars	Human labour (person days)	Bullock labour (pair days)	Machine power (hours)
Redgram			
Partially-implemented villages	12.56	1.77	1.86
Fully-implemented villages	12.57	1.83	2.70
Mean difference	0.01	0.06	0.83
‘t’ value	0.18 ^{NS}	1.91 ^{NS}	3.24*
Rabi jowar			
Partially-implemented villages	9.55	1.76	2.25
Fully-implemented	9.80	1.771	2.26
Mean difference	0.25	0.01	0.30
‘t’-value	0.26 ^{NS}	0.05 ^{NS}	2.38*

Note: * Significant at 5 per cent level

NS=Non-significant

of higher risk in getting back the returns due to uncertainty in rainfall.

Labour-use Pattern in Redgram and *Rabi Jowar*

In redgram, the farmers in fully-implemented MGNREGA villages had engaged more human labour (12.57 person days), bullock labour (1.83 pair days) and machine power (2.70 hours) in comparison with partially-implemented MGNREGA villages (12.56 person days), (1.77 pair days) and (1.86 hours) (Table 2). The machine power used by farmers was higher in fully-implemented than partially-implemented MGNREGA villages. The difference in use of human labour and bullock labour was non-significant between fully and partially-implemented MGNREGA villages.

In the *rabi jowar*, the farmers in the fully-implemented MGNREGA villages had engaged marginally more human labour (9.80 person days), bullock labour (1.77 pair days) and machine power (2.56 hours) than in partially-implemented MGNREGA villages (9.55 person days), (1.76 pair days) and (2.25 hours). The machine power used by farmers was significantly higher in fully-implemented than partially-implemented MGNREGA villages. The difference in use of human labour and bullock labour was non-significant between fully and partially-implemented MGNREGA villages. The farmers in fully-implemented MGNREGA villages were found shifting towards

mechanization due to prevalence of higher wage rates, which had resulted in increase in cost of crop cultivation. However, the process was slow because a large part of the study area was rainfed, but still it was quite evident. The findings are in contrast with those of Sontakki and Ahire (2011), who have reported that the labour crunch is likely to fuel demand for expensive mechanical sowing devices, such as transplanter in paddy, among capital-intensive farmers of Punjab and Haryana.

Cost of Cultivation of Redgram and *Rabi Jowar*

The cost of cultivation of redgram was significantly higher (22.91%) in fully-implemented (₹7391/acre) than partially-implemented (₹5698/acre) MGNREGA villages. It was due to significantly higher cost on labour (27.20%) and machinery (42.10%) in the fully-implemented MGNREGA villages (Table 3). The prevailing labour wage rates were higher in fully-implemented than partially-implemented MGNREGA villages. The material input cost was also higher (12.82%) in fully-implemented than partially-implemented MGNREGA villages. It was due to application of higher doses of chemical fertilizers and plant protection chemicals in fully-implemented MGNREGA villages. The interest on working capital was significantly higher in fully-implemented (₹104/acre) than partially-implemented (₹81/acre) MGNREGA villages due to higher total variable cost.

Table 3. Cost of cultivation of redgram and *rabi jowar* in fully- and partially - implemented MGNREGA villages

	(₹/acre)				
Particulars	Partially- implemented villages	Fully- implemented villages	% change in fully- implemented over partially-implemented	Mean difference	't'-value
Redgram					
Material input cost	702	792	12.82	90	1.75 ^{NS}
Labour charges	950	1305	27.20	355	5.37*
Bullock charges	524	560	6.43	36	1.47 ^{NS}
Machine charges	180	311	42.12	131	5.16*
Interest on working capital (3%)	81	104	22.12	23	7.96*
Total fixed cost	2903	3821	24.03	918	9.07*
Total cost of cultivation	5698	7391	22.91	1693	10.80*
Rabi jowar					
Material input cost	383	446	16.45	63	1.86 ^{NS}
Labour charges	702	1007	30.29	305	3.03*
Bullock charges	507	521	2.69	14	0.30 ^{NS}
Machine charges	73	81	9.88	8	0.62 ^{NS}
Interest on working capital (3%)	51	64	20.31	13	2.72*
Total fixed cost	2065	2402	14.03	337	5.69*
Total cost of cultivation	3781	4521	16.37	740	4.60*

Note: * Significant at 5 per cent level

NS=Non-significant

Similarly, the total fixed cost was higher (24.03%) in fully-implemented (₹ 3821/acre) than partially-implemented (₹ 2903/acre) MGNREGA villages. The land rent paid was higher in fully-implemented MGNREGA villages as the lands had better access to irrigation and infrastructural facilities in comparison with partially-implemented MGNREGA villages.

In the *rabi jowar*, the cost of cultivation in fully-implemented MGNREGA villages (₹ 4521/acre) was significantly higher (16.37%) compared to partially-implemented (₹ 3781/acre) MGNREGA villages due to higher cost on labour wage rates. The cost on material input was higher by 16.45 per cent in fully-implemented compared to partially-implemented MGNREGA villages. The application of chemical fertilizers was higher in fully-implemented MGNREGA villages. The interest on working capital, total variable cost, total fixed cost were all higher in fully-implemented than partially-implemented MGNREGA villages (Table 3). The land rent was higher in fully-implemented MGNREGA villages because of better access to irrigation and infrastructural facilities.

Returns from Redgram and *Rabi Jowar*

The redgram yield was significantly higher (18.95%) in fully-implemented than partially-implemented MGNREGA villages, due to higher input-use, better irrigation facilities and slightly better soil fertility status (Table 4). Hence, the gross returns obtained by farmers were higher by 17.82 per cent in the fully-implemented MGNREGA villages. However, the net returns obtained by the fully-implemented MGNREGA village farmers (₹ 99/acre) were lower by more than 300 per cent compared to those of partially-implemented MGNREGA village farmers (₹ 457/acre). The higher cost of cultivation (22.91 %) due to higher cost on labour and machinery resulted in lower net returns in the fully-implemented MGNREGA villages. The returns per rupee of investment were marginally lower in the fully-implemented (1.01) compared to partially-implemented (1.08) MGNREGA villages.

In the *rabi jowar*, both the main yield (2.54 q/acre) and by-product yield (2.09 bullock cart/acre) obtained in fully-implemented MGNREGA villages were higher by 11.81 per cent and 6.22 per cent,

Table 4. Returns in redgram and *rabi jowar* in fully- and partially-implemented MGNREGA villages in Gulbarga district (per acre)

Particulars	Partially-implemented villages	Fully-implemented villages	% change in fully-implemented over partially-implemented	Mean difference	't'-value
Redgram					
Average yield (q/acre)	1.54	1.90	18.95	0.36	2.20*
Average price (₹/q)	3997	3942	-1.40	55	1.84 ^{NS}
Gross return (₹/acre)	6155	7490	17.82	1335	2.04*
Cost of cultivation (₹/acre)	5698	7391	22.91	1693	10.80*
Net return (₹/acre)	457	99	-361.62	358	0.61 ^{NS}
Returns per rupee of investment	1.08	1.01	-6.93	0.07	1.10 ^{NS}
Rabi jowar					
Average yield (q/acre)	2.24	2.54	11.81	0.3	1.02 ^{NS}
Average price (₹/q)	2200	2200	0	0	-
Average by-product yield(bullock cart)	1.96	2.09	6.22	0.13	0.99 ^{NS}
Average by-product price (₹/ bullock cart)	1093	1075	1.67	18	0.45 ^{NS}
Gross return (₹/acre)	7061	7837	9.90	776	1.04 ^{NS}
Cost of cultivation (₹/acre)	3781	4521	16.37	740	4.60*
Net return (₹/acre)	3280	3316	1.09	36	0.05 ^{NS}
Returns per rupee of investment	1.87	1.73	8.09	0.14	0.66 ^{NS}

Note: * Significant at 5 per cent level

NS=Non-significant

Table 5. Labour productivity in redgram and *rabi jowar* in fully- and partially- implemented MGNREGA villages in Gulbarga district

Particulars	Redgram		<i>Rabi jowar</i>	
	Males	Females	Males	Females
Partially-implemented villages	18.58	9.29	18.00	9.13
Fully-implemented villages	22.47	12.46	22.68	11.95
% change in fully-implemented over partially-implemented villages	17.31	25.44	20.63	30.89

respectively compared to in partially-implemented MGNREGA villages. Hence, both gross returns as well as net returns obtained by fully-implemented MGNREGA village farmers were higher compared to those of partially-implemented MGNREGA village farmers. However, the returns per rupee of investment were marginally lower in the fully-implemented (1.73) as against partially-implemented (1.87) MGNREGA villages. The higher cost of cultivation (16.37%) due to higher labour cost had resulted in lower returns per rupee of investment in the fully-implemented MGNREGA villages.

Labour Productivity in Redgram and *Rabi Jowar*

In both redgram and *rabi jowar*, the labour productivity was lower for both male and female labourers in fully-implemented MGNREGA villages for all operations in comparison with partially-implemented MGNREGA villages (Table 5). The wage rates were higher (both male and female) in fully-implemented than partially-implemented MGNREGA villages for all operations in redgram and *rabi jowar*. The implementation of MGNREGA had increased the wage rates in the fully-implemented MGNREGA villages. As

per the wage fund theory given by J.S. Mill, in any country certain fixed proportion of capital is set aside for payment of wages to the labourers termed as wage fund. The wage at particular point of time is determined by the amount of wage fund available and the total workers. After the implementation of MGNREGA, the wage fund had increased considerably in the fully-implemented MGNREGA villages but the rate of increase in the total labourers remained almost constant, which led to increase in wage rates. The findings are in similar line with Kareemulla *et al.* (2009) who have reported that the implementation of MGNREGA had affected labour supply and wage rates for agricultural operations. The increase in wage rate was 34 per cent per annum in the peak agricultural season than slack season. Similar observations have been made by Sharma (2009) and Sontakki and Ahire (2011).

Conclusions and Implications

The study has revealed a significant difference in the use of machine power between fully- and partially-implemented MGNREGA villages due to higher wage rates in the former category of villages. Not much difference has been observed in the use of material inputs and labour in redgram and *rabi jowar*. The cost of cultivation has been found higher for both the crops in the fully-implemented MGNREGA villages due to significantly higher cost on labour. The labour productivity for both male and female has been observed lower in fully-implemented MGNREGA villages in both the crops for all the operations in comparison with that in partially-implemented MGNREGA villages. The wage rates (both male and female) in fully-implemented villages were considerably higher in fully-implemented than partially-implemented MGNREGA villages. In view of increasing wage rates and reducing labour productivity, the following implications have been drawn from the study:

- The farmers are advised to use weedicides instead of manual labour and engage harvester-cum-thresher to minimize the cost of cultivation of redgram.

- The village *panchayats* are re-emphasized not to coincide MGNREGA works with peak agricultural season.
- The *gram sabha* is advised to compulsorily monitor the effective working hours of labour engaged for different works under MGNREGA to avoid its demonstration effect on labours engaged by farmers.
- The village *panchayats* are suggested to implement MGNREGA on productive activities like construction of farm ponds, check dams, *nala* bunds and planting of trees on bunds to enhance cropping intensity and productivity.

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