Chapter 5
Has Profitability of Foodgrain Production Declined After Implementation of MGNREGS in India?

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5.1 Introduction

The major objective of this study is to find out whether the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has affected the profitability of crops cultivated in different parts of India. Several scholars have argued vehemently in recent days that 'MGNREGS has "pushed up" the average wage of casual workers and distorted the rural labour markets by diverting large number of labour from agriculture to non-farm rural jobs, thus creating an artificial labour shortage and raising the cost of production of agricultural commodities' (Gulati et al. 2013a, b, c, p. 9). As a result of increased cost of production, the profitability of different crops reportedly has declined.

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Several studies and reports published in various sources, including vernacular dailies,[1] especially those published in south India, have reported declining profitability of farmers due to the introduction of National Rural Employment Guarantee Scheme (MGNREGS). Some of the past studies have shown that it helps getting the assured wage rate and employment to rural poor in most of the states where it is implemented effectively (Shah 2009; Mukherjee and Sinha 2011; Dutta et al. 2012; MoRD 2012; Mann and Ramesh 2013). But, other studies have shown the contradictory evidence as well (Gulati et al. 2013a, b, c).

Several past studies have also reported that since implementation of the MGNREGS, the growth of agricultural sector declined that has already been passing through a serious crisis since the early 1990s because of increased cost of cultivation and poor remuneration from crop cultivation (Harish et al. 2011; Narayanamoorthy and Alli 2013; Gulati et al. 2013a, b, c). In many places, this scheme is operated throughout the year including in the busy seasons of agriculture. As a result, it has created unusual labour scarcity in the rural areas which resulted in steep increase in the wage rate of agricultural labourers (Shah 2009; Dutta et al. 2012; Berg et al. 2012; Gulati 2013a, b, c).

Likewise, some studies have also reported that introduction of MGNREGS has also reportedly deteriorated the quality of labour uses in several parts of the country, considerably, meaning that the effective working hours of labour has reduced which is ultimately increasing the labour requirement for the given operation (Verma and Shah 2012). Both the increased wage rate and requirement of labour have reportedly increased the cost of cultivation of different crops substantially since the introduction of MGNREGS (Chandrasekar and Ghosh 2011).

As the farm output prices are not fixed in consonance with the rise in the cost of cultivation in India, the losses from crops cultivation reportedly increased for farmers. Importantly, citing increased wage rate due to MGNREGS in agriculture, farmers belonging to the fertile region of Andhra Pradesh have even declared 'paddy crop holiday' in the large area during Kharif season 2011 (GoAP 2011; Narayanamoorthy and Alli 2012).

The farm wage rate and cost of cultivation are determined by irrigation coverage and host of other factors which vary widely from one region to another in India. Given the wide variation in determining factors, is it correct to say that the MGNREGS is increasing farm wage rate which results in increased cost of cultivation uniformly across different crops and states in India? Even if one accepts the

[1]A large number of news reports have been published in various national and state level news papers covering the issue of NREGS's impact on crop cultivation and its profitability since the introduction of the national rural employment scheme. Most news reports have highlighted the sufferings of the farmers due to non-availability of labour and increased wage rate after the introduction of NREGS. For instance, *Dinamani*, a popular news paper in South India, has brought out many reports on this issue during 2009 (August 6, August 23, September 11, November 5), 2010 (January 1, February 11, September 25, November, 27), 2011 (January 25 and 31) and also during 2012 (April 24 and August 17). Many news reports focusing on this same issue have also been published during 2013 and 2014 in various news papers.

argument that MGNREGS increases the farm wage rate, will the impact of it on wage rate and cost of cultivation be the same across high and low irrigated states? Quite a few studies have analysed the implementation, equity and governance aspects of MGNREGS after the implementation of this scheme (Aiyar and Samji 2006; Bhatia and Dreze 2006; Chakraborty 2007; Gopal 2009; Khera and Nayak 2009; Adhikari and Bhatia 2010; Jha et al. 2009, 2011; Imbert and Papp 2011; Liu and Barrett 2013).

Several studies have shown that the MGNREGS has been relatively successful since it directly provides more employment opportunities and wage to the poor in the rural areas (Dutta et al. 2012; MoRD 2012). Although the employment guarantee scheme has multiplier impacts on village economy that help in ameliorating the standards of living, it is also expected to cause a hike in agricultural wages (Berg et al. 2012; Hirway et al. 2008).

Gulati et al. (2012) reported that by distorting the rural labour markets through creating an artificial labour shortage, the employment scheme has reportedly raised the cost of production of agricultural commodities. As a result, farmers have been facing an adverse effect on the farm profitability in major crops (Narayanamoorthy 2013; Reddy and Reddy 2007).

Although a large number of studies have analysed the impact of the employment scheme on farm wage rate particularly, not many detailed studies are available as to what happened to the profitability of crops covering major states and major crops of India. Given the absence of detailed macro-level data-based studies, one cannot come to a conclusion that MGNREGS has reduced the profitability of the crops uniformly across states.

Moreover, the surplus labour available is less in the irrigated regions as compared to un-irrigated regions and therefore, the impact of MGNREGS on the cost of human labour will not be the same between the two regions. Irrigation coverage to the cropped area, cropping pattern, intensity of crop cultivation, availability of labour and rural infrastructure facilities widely vary across the states. Accordingly, the crop profitability is also a function of irrigation, infrastructure and other input factors noted above (Vishandass and Lukka 2013), the impact of MGNREGS on the profitability of crops may not be the same across the states.

Keeping this in view, an attempt is made in this study to find out the impact of MGNREGS on the cost of cultivation as well as the profitability of different major crops, utilising the cost of cultivation survey data. The specific objectives of the study are:

1. To analyse change in the cost of human labour in different operations of selected crops before and after the introduction of rural employment guarantee scheme,
2. To examine the change on the overall pattern of the cost of cultivation in different crops before and after the introduction of rural employment guarantee scheme.
3. To estimate the profitability in different crops also including imputed value of family labour cost (cost C2) before and after the introduction of rural employment guarantee scheme.

5.2 Data and Methodology

The entire study has been carried out utilising crop-wise cost of cultivation survey data covering the period from 2000–01 to 2010–11.[2] The Commission for Agricultural Costs and Prices (CACP) has been publishing valuable time series data on operation-wise costs, productivity, income, etc., for various important crops over the years. For studying the profitability of crops cultivation, all the costs and income related data have been compiled from various CACP's publications and also from its website.

The labour and other inputs required for the cultivation of different crops are not the same, which is also expected to be varied in different states depending upon the intensity of crops cultivation. The intensity of input use in high productivity states will be totally different from the states that are producing relatively low productivity in any crop.

Profit level is also expected to be different for different crops because of nature and market conditions. One of the objectives of the study is to find out whether the profitability of crop varies with the states having high and low productivity. Keeping this in view, a total of five foodgrain crops, namely, paddy, wheat, jowar, gram and tur have been considered for the study. Based on the productivity data of Triennium Ending 2010–11, for each crop, two states belonging to the category of high area with high productivity (HAHP) and high area with low productivity (HALP) have been considered for studying the profitability of crops. The details of crops and the states selected for the analysis are presented in (Table 5.1). States have been selected based on the cultivated area and productivity of the crops.

As regards the method of profit calculation, CACP has been using nine different cost concepts (A1, A2, A2 + FL, B1, B2, C1, C2, C2* and C3) for measuring the economics of various crops cultivation. Details on each of the cost types are provided in the appendix section. For this study, cost C2 has been considered for computing the profitability of various crops as it covers the entire variable and fixed costs needed for crop cultivation.

The objective is to study whether or not the profitability in different crops cultivated in different states had increased after the introduction of MGNREGS. For this, all the costs and income related data have been converted into constant prices using Consumer Price Index of Agricultural Labour (CPIAL) deflator at 1986–87 prices. Profit level of the crop is computed by deducting the cost C2 from the value of output. For purpose of analysis, the study period has been divided into two sub-periods as pre-MGNREGS (2000–01 to 2005–06) and post-MGNREGS (2005–06 to 2010–11) to capture the impact of the national rural employment scheme on the cost of cultivation and profitability.

[2]In order to capture the very latest development in the profitability of different crops, we ideally wanted to cover the data up to 2012–13. But, unfortunately the CACP has published cost and income related data of different crops only up to 2010–11 as on July 2014.

Table 5.1 Details of crops and states selected for the study

Crops	States selected for study	Category of state selected	Area (mha)		Yield (kg/ha)	
			TE 2005–06	TE 2010–11	TE 2005–06	TE 2010–11
1. Paddy	Andhra Pradesh	HAHP	3.35 (9.12)	4.19 (11.08)	3,020	3,114
	Odisha	HALP	4.48 (10.26)	4.35 (9.87)	1,491	1,577
2. Wheat	Punjab	HAHP	3.46 (13.10)	3.52 (12.07)	4,202	4,487
	Madhya Pradesh	HALP	3.97 (13.94)	4.13 (14.93)	1,716	1,816
3. Jowar	Karnataka	HAHP	1.63 (17.53)	1.33 (16.80)	806	1,129
	Maharashtra	HALP	4.65 (54.67)	4.10 (55.01)	745	862
4. Gram	Madhya Pradesh	HAHP	2.70 (36.94)	3.01 (33.84)	927	972
	Rajasthan	HALP	1.08 (15.58)	1.31 (19.37)	607	760
5. Tur	Maharashtra	HAHP	1.08 (30.73)	1.13 (29.75)	664	730
	Karnataka	HALP	0.57 (16.76)	0.70 (20.37)	539	529

Notes: *HAHP* High area with high productivity, *HALP* High area with low productivity, *TE* Triennium ending; Figures in brackets are percentage to India's total area
Sources Computed utilising data and www.dacnet.nic.in

5.3 Analysis and Discussion

As reported earlier, this study covers five different foodgrain crops for analysis. These five selected crops are not the same in terms of its duration, coverage of irrigation, productivity, value of output, etc. The states that are selected for the analysis of each crop are also not the same. Therefore, it is prudent to analyse the profitability of each crop separately rather than taking all the crops together. First analysis of the profitability of paddy crop before and after the introduction of MGNREGS is done.

5.3.1 Profitability in Paddy

Paddy is one among the important and labour-intensive crops cultivated in most parts of India. It has been reported especially in south India that the introduction of National Rural Employment Scheme has created artificial demand for labour which resulted in increased labour cost required for crop cultivation.

As generally human labour cost accounts for close to one-third of cultivation cost in paddy, this increased labour cost has reportedly increased the gross cost of cultivation that eventually affected the profitability of paddy crop.

Is it correct to say that the human labour cost required for paddy cultivation has increased after the introduction of rural employment scheme? What is the increase in labour cost vis-à-vis the costs of other operations? Will the profitability be affected only due to the increase in labour cost that occurred because of rural employment scheme? What was the state of labour cost in paddy cultivation before the introduction of the employment scheme? There is need to find out answers to these questions to make any judgment as to whether or not the rural employment programme has made any impact on the profitability of paddy crop.

Profitability of any crop is directly linked with its productivity, which is highlighted by many studies (Bhalla and Singh 2012). Therefore, as mentioned in the methodology section, two states having the characteristics of high area with high productivity (HAHP) and high area with low productivity (HALP) have been selected for the analysis. While Andhra Pradesh has been considered as HAHP state, Odisha has been selected as HALP state in paddy crop for the detailed analysis.

Table 5.2 presents the trends in operation-wise cost, productivity, value of output and profit for paddy crops for the two selected states for pre and post-MGNREGS period. For the purpose of analysis, the operation-wise cost has been classified into five categories, namely cost on human labour, cost of bullock labour, machine labour cost, costs on yield increasing inputs and other costs. This classification is done in order to find out the pattern of human labour cost in comparison to other operations of paddy cultivation.

It is clear from Table 5.2 that there has been a substantial variation in the operation-wise cost of cultivation between the two periods considered for the analysis. This is particularly true in the case of cost of human labour, which is discussed widely as a serious issue after the introduction of national rural employment programme.

The cost of human labour has increased at a rate of 6.13% per annum in HAHP state during post-MGNREGS period, but the same grew at a negative rate of −1.84% during pre-MGNREGS period. What is interesting here is that this has happened despite significant increase in the cost of machine labour which grew at a rate of 7.50% per annum during post-MGNREGS period. It is generally expected that the cost of human labour would decline when farmers spend more cost on the machine labour. But, this has not happened in the case of HAHP state in paddy cultivation.

This implies that the wage rate paid for the human labour used for paddy cultivation has increased substantially possibly due to the introduction of the national rural employment programme. The growth rate in human labour cost is also found to be much higher as compared to the costs of all other major operations during the post-MGNREGS period. As a result of fast increase in cost of human labour and machine labour, the gross cost of cultivation (cost C2) of paddy has also

Table 5.2 Cost and profitability of paddy cultivation from 2000–01 to 2010–11 (values in Rs. at 1986–87 prices)

Parameters	Particulars	Andhra Pradesh (HAHP)			Odisha (HALP)		
		2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11	2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11
Human labour	Cost (Rs.)	2,709	3,157	2,913	2,034	2,141	2,083
	CGR (%)	−1.84	6.13	1.33	1.05	4.19	2.18
	Share (%)	31.25	34.14	32.30	38.59	39.37	39.07
Bullock labour	Cost (Rs.)	281	158	223	636	562	598
	CGR (%)	−0.39	−10.09	−4.73	1.55	−1.03	−0.40
	Share (%)	3.25	1.71	2.47	12.06	10.43	11.22
Machine labour	Cost (Rs.)	550	851	705	121	153	136
	CGR (%)	4.24	7.50	6.46	12.42	0.44	6.70
	Share (%)	6.34	9.21	7.81	2.30	2.83	2.55
Yield enhancing inputs	Cost (Rs.)	2,005	1,765	1,850	850	766	806
	CGR (%)	2.22	−2.17	−2.85	0.32	−2.96	−1.55
	Share (%)	23.13	19.09	20.52	16.12	14.22	15.12
Other cost (fixed costs)	Cost (Rs.)	3,220	3,501	3,381	1,630	1,786	1,708
	CGR (%)	1.00	1.13	0.62	1.06	−0.24	−0.04
	Share (%)	37.16	37.85	37.49	30.93	33.15	32.04
Cost C2	Cost (Rs.)	8,667	9,248	9,018	5,271	5,389	5,331
	CGR (%)	−0.58	2.62	0.57	1.21	1.12	0.76
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of output	VOP (Rs.)	8,810	10,030	9,507	4,088	4,851	4,501
	CGR (%)	0.48	1.58	0.95	0.19	2.60	1.13
Yield (qtl/ha)		50.49	53.29	52.04	29.42	30.64	30.01
Profit (VOP-C2)		143	782	489	−1,182	−538	−829
Number of years profit realised		4/6	4/5	8/11	0/6	0/5	0/11

Notes: *CGR* Compound growth rate percent/per annum, *HAHP* High area with high productivity and *HALP* High area with low productivity

Sources Computed using data from CACP (various years)

increased at a rate of 2.62% per annum during post-MGNREGS period, which was not the case during pre-MGNREGS period.

The pattern of cultivation of crops is not the same across the states in India. Some states have been following intensive agriculture by adopting modern technological inputs, while other states are following different forms of cultivation practices. Therefore, one may not be able to firmly conclude that what is happening in one state is same in all other states. Specifically, the labour use pattern and the wage rate are widely varied across the states.

In view of this, another state namely Odisha has been selected under the category of HALP so as to find out whether or not the pattern of operation-wise cost of cultivation is same in comparison to HAHP state. As expected, the pattern of operation-wise cost including the cost of human labour in HALP state varied from the HAHP state during both pre and post-MGNREGS period.

However, the cost of human labour, which is one of our main focuses in the paper, has increased at a faster pace during post-MGNREGS period as compared to its previous time period considered for the analysis. For instance, the cost of human labour increased at a rate of 4.19% per annum during post-MGNREGS period, but the same has increased only at a rate of 1.05% per annum during pre-MGNREGS period.

In contrast to the human labour cost, the growth rate in machine labour cost has decelerated sharply after the introduction of rural employment scheme, which is something unexpected. The gross cost of cultivation (cost C2) too has decelerated in HALP state during post-MGNREGS period because of the slow pace of growth in the cost of all other operations except the human labour cost.

Overall, what is clear from the analysis of operation-wise cost is that although the cost pattern is not the same between the two states, the cost of human labour has increased at relatively faster pace in both the states after the introduction of rural employment scheme.

One of the major objectives of the study is to find out whether the profitability in crops cultivation has affected after MGNREGS. It has been argued in the recent years that the rural employment scheme introduced throughout the country has created artificial demand for labour which resulted in increased cost of human labour.

After studying operation-wise cost of cultivation, the focus is towards the profitability of paddy crop. It is to be noted here that the profitability of any crop is determined not only by the cost of cultivation but also by the factors such as productivity of the crop, market price, etc.

The results presented in Table 5.2 shows that the average value of paddy output increased from ₹ 8,810/ha in 2000–06 to ₹ 10,030/ha in 2006–11 (output measured at market prices only) in HAHP states, showing a much faster pace of growth rate during post-MGNREGS period. As a result of the faster growth in VOP, the profitability from paddy increased from ₹ 143 to ₹ 782/ha during the period 2001–06 and 2006–11.

Although the absolute profitability is very meager, it increased manifold during post-MGNREGS period as compared to its earlier period. Not only has the profitability increased after the introduction of employment scheme, but the number of years profit realised by the farmers have also increased during post-MGNREGS period in HAHP state (see, Fig. 5.1).

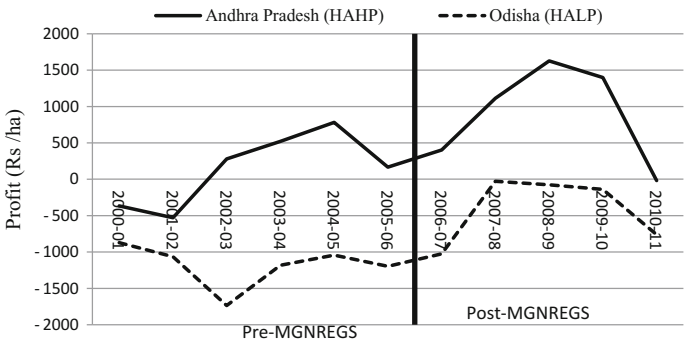

Fig. 5.1 Profitability in paddy cultivation at 1986–87 price

The profitability scenario of HALP state is totally different from HAHP state. While no significant increase is noticed in VOP between pre and post-MGNREGS period, the losses incurred by the farmers in cultivating paddy have reduced from ₹ 1,182 to ₹ 538/ha during this period.

Surprisingly, farmers belonging to HALP state could not reap profit even in single year during the entire period of analysis from 2000–01 to 2010–11. Although the cost of cultivation is very low in HALP as compared to HAHP state, farmers are unable to reap any profit from paddy cultivation possibly because of low productivity. This suggests that it is difficult to increase the profitability without increasing its productivity.

5.3.2 Profitability in Wheat

Wheat is an important foodgrain crop cultivated predominantly during rabi season in different parts of the country. It accounts for about 24% of India's total foodgrains area and about 37% in India's gross production of foodgrains during 2011–12. Similar to paddy crop, it is also cultivated mostly under irrigated conditions where the cost of cultivation is generally higher; human labour cost accounts for about 10–17% of cost C2 of wheat crop.

Therefore, the introduction of MGNREGS may have made some impact on the profitability of wheat crop through increased human labour cost in different states. In order to study the profitability in wheat crop, two states have been selected having the characteristics of HAHP and HALP. Punjab (the highest productivity state in wheat in India) has been considered as HAHP state, while Madhya Pradesh (MP) has been selected as HALP state for the analysis.

The details of operation-wise cost, gross cost of cultivation, value of output and profit pertaining to wheat crop for the two selected states are presented in Table 5.3. The pattern of profitability in HAHP state is studied first. It is expected that the human labour cost would have gone up considerably after the introduction of MGNRES in wheat crop.

But against the expectation, the human labour cost has increased only marginally. For instance, the average human labour cost during pre-MGNREGS period was ₹ 757/ha, which has increased to ₹ 831/ha during post-MGNREGS period. The growth rate computed for pre and post-MGNREGS period also shows that the cost of human labour incurred for the cultivation of wheat crop in Punjab has decelerated (−1.67%) during post-MGNREGS period as compared to its previous period (−1.00%). This happened despite deceleration in the cost of machine labour during post-MGNREGS period. Interestingly, the real cost of all other operations has also decelerated during post-MGNREGS period, which is something not noticed in the case of paddy crop.

On the whole, the analysis on HAHP state shows that the real cost of human labour incurred for the cultivation of wheat crop has not increased during post-MGNREGS period. What happened to the profitability of wheat crop after the introduction of MGNREGS is the next key question probed in the study. As per the data of CACP, the gross cost of cultivation (C2) has increased marginally from ₹ 7,249 to ₹ 7,773/ha between 2000–06 and 2006–11 in Punjab. But, in spite of the

Table 5.3 Cost and profitability of wheat cultivation from 2000–01 to 2010–11 (values in Rs. at 1986–87 prices)

Parameters	Particulars	Punjab (HAHP)			Madhya Pradesh (HALP)		
		2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11	2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11
Human labour	Cost (Rs.)	757	831	790	738	787	760
	CGR (%)	−1.00	−1.67	−0.83	0.24	1.01	0.64
	Share (%)	10.44	10.69	10.56	16.89	15.78	16.35
Bullock labour	Cost (Rs.)	27	17	23	238	148	197
	CGR (%)	−10.10	−14.01	−9.63	0.52	−13.12	−5.40
	Share (%)	0.38	0.22	0.30	5.44	2.96	4.23
Machine labour	Cost (Rs.)	1,064	1,169	1,112	426	601	506
	CGR (%)	3.67	−0.60	1.73	7.99	4.63	6.26
	Share (%)	14.68	15.04	14.85	9.77	12.05	10.88
Yield enhancing inputs	Cost (Rs.)	1,665	1,394	1,542	1,202	1,180	1,192
	CGR (%)	1.26	−5.07	−2.36	2.73	−3.86	0.31
	Share (%)	22.97	17.94	20.59	27.54	23.65	25.64
Other costs (fixed costs)	Cost (Rs.)	3,736	4,348	4,014	1,762	2,272	1,994
	CGR (%)	−0.45	0.66	0.92	4.36	−0.57	2.94
	Share (%)	51.54	55.94	53.62	40.36	45.55	42.89
Cost C2	Cost (Rs.)	7,249	7,773	7,487	4,366	4,989	4,649
	CGR (%)	0.39	−0.67	0.28	3.41	−0.86	1.98
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of output	VOP (Rs.)	8,450	7,918	8,209	4,234	6,240	5,146
	CGR (%)	−2.25	−0.96	−0.57	6.84	0.70	5.54
Yield (qtl/ha)		43.19	42.49	42.87	19.83	24.81	22.09
Profit (VOP-C2)		1,202	1,887	1,513	−132.19	1,251.37	496.70
Number of years profit realised		6/6	5/5	11/11	3/6	5/5	8/11

Notes and Sources Same as in Table 5.2

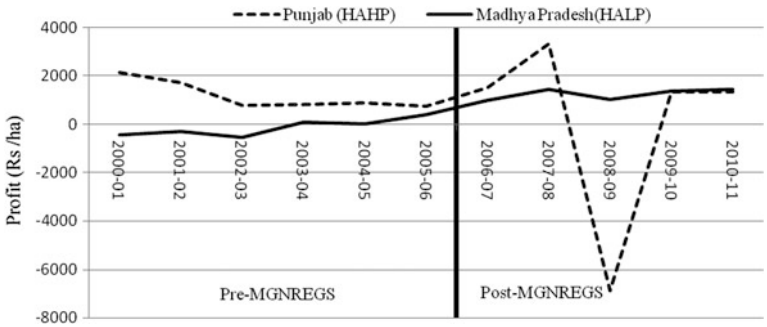

Fig. 5.2 Profitability in wheat cultivation at 1986–87 price

marginal increase in cost C2, the profitability from wheat cultivation has increased from ₹ 1,202 to ₹ 1,887/ha during this period.

The results of wheat crop discussed above in relation with HAHP state are in many ways different from HALP state (Madhya Pradesh). In spite of substantial growth in machine labour cost during post-MGNREGS period (4.63%), the human labour cost spent for the cultivation of wheat has increased at a rate of 1.01% per annum during this period. This is different from the results arrived above with HALP state. This seems to suggest that although the national rural employment programme has been in operation across all the states in India, the impact of it on labour cost is not the same in all the states because the factors determining the wage cost of agricultural labour are not the same.

Whatever may be the reasons for the increased wage cost, the results from HALP state show that the profitability from wheat crop has increased dramatically from Rs. −132 to ₹ 1,251/ha between pre and post-MGNRES period in HALP state. This raise in profit is mainly due to increased productivity of wheat which had increased from 19.83 to 24.81 qtl/ha between the two periods.

This analysis of wheat crop, on the whole, suggests that the introduction of MGNREGS has not affected the profitability in both the high and low productivity states as the number of years profit realised by the farmers have increased after its introduction (Fig. 5.2).

5.3.3 Profitability in Jowar

Jowar is another food grain crop which is considered for the analysis for two reasons. First, unlike paddy and wheat crops, jowar is cultivated predominantly under rainfed condition.[3] Second, it is generally treated as a low-value crop in comparison to paddy and wheat crops.

[3]The coverage of irrigation in jowar crop is very low in India; it increased only from 3.60% in 1960–61 to 8.70 in 2011–12. This is very low when compared to the crops like paddy and wheat where the coverage of irrigation is 58.60 and 92.10%, respectively, during 2010–11.

Therefore, studying the profitability of this crop would give some interesting results that will be useful to compare with other high value cereal crops. As followed earlier, two states namely Karnataka and Maharashtra have been considered for the analysis of jowar crop. While Karnataka has been selected as HAHP state, Maharashtra has been considered as HALP state for the purpose of analysis.

First, the analysis of the profitability of jowar crop is done by taking data from HAHP state. It is evident from Table 5.4 that the cost of human labour incurred for cultivating jowar has increased at a faster rate after MGNRGES. The real human labour cost increased at a rate of 10.24% per annum from 2006–07 to 2010–11, whereas the same was almost constant (0.01%) during pre-MGNRGES period.

In terms of value, an average of ₹ 850/ha was incurred on account of human labour during post-MGNRGES period which was only ₹ 567/ha during pre-MGNRGES period. It is generally expected that the machine labour cost would be less wherever the human labour cost is higher for any crop cultivation. But contrary to this, the machine labour cost too has increased at a much faster rate (9.36% per annum) after the introduction of employment scheme in Karnataka which is an interesting result.

The increased human as well as machine labour cost has also made substantial impact on the gross cost of cultivation (C2) after the introduction of employment scheme. Despite substantial reduction in the cost on yield increasing inputs, the cost C2 increased at a rate of 4.15% per annum during post-MGNRGES period as against the negative rate of −0.31% per annum during pre-MGNRGES period.

However, the increased labour cost as well as the gross cost (C2) have not made any big impact on the profitability of jowar in HAHP state; the average profit in relation to cost C2 was negative during both pre and post-MGNRGES period. It appears that although the cost of cultivation in jowar has increased after the employment scheme, it has not made any significant damages on its profitability (Fig. 5.3).

The profitability of jowar in HALP state (Maharashtra) is somewhat different from its counterpart state of HAHP. The results show that the real human labour cost increased at a rate of 8.70% per annum during post-MGNRGES period as against the negative growth of −1.44% during pre-MGNRGES period. This is almost matching with the result of HAHP state. The cost of machine labour too increased at an appreciable rate (6.66%) during post-MGNRGES period which also increased at a rate of 7.49% per annum during pre-MGNRGES period. Possibly because of slower increase of machine labour cost, the gross cost of cultivation has increased at a rate of 3.62% per annum, which is little lower (2.83%) than the increase experienced during pre-MGNRGES period.

As observed in HAHP state, the changes observed in cost of cultivation during pre and post-MGNRGES period have not made any impact on the profitability of jowar. Profitability is found to be negative at both periods considered for the analysis. The only difference noted between the two periods is the magnitude of losses (in relation cost C2) incurred by jowar farmers is relatively less during post-MGNREGS period as compared to pre-MGNRGES period.

Table 5.4 Cost and profitability of Jowar cultivation from 2000–01 to 2010–11 (values in ₹ at 1986–87 prices)

Cost/Profit	Particulars	Karnataka (HAHP)			Maharashtra (HALP)		
		2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11	2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11
Human labour	Cost (Rs.)	567	850	695	1,055	1,240	1,139
	CGR (%)	0.01	10.24	4.33	−1.44	8.70	2.24
	Share (%)	28.32	36.63	32.40	28.09	28.69	28.38
Bullock labour	Cost (Rs.)	452	348	404	855	930	889
	CGR (%)	4.25	−7.33	−1.76	10.61	−4.14	3.04
	Share (%)	22.57	14.98	18.84	22.78	21.51	22.16
Machine labour	Cost (Rs.)	111	160	134	220	296	255
	CGR (%)	−3.80	9.36	2.35	7.49	6.66	5.49
	Share (%)	5.55	6.91	6.22	5.86	6.86	6.35
Yield enhancing inputs	Cost (Rs.)	310	276	295	557	532	546
	CGR (%)	−5.56	−8.65	−4.99	0.49	−2.43	−1.89
	Share (%)	15.50	11.89	13.73	14.83	12.31	13.59
Other costs (fixed costs)	Cost (Rs.)	561	687	618	1,068	1,323	1,184
	CGR (%)	0.10	7.62	2.71	2.44	6.01	3.83
	Share (%)	28.05	29.59	28.81	28.45	30.63	29.51
Cost C2	Cost (Rs.)	2,001	2,321	2,146	3,756	4,321	4,013
	CGR (%)	−0.31	4.15	1.63	2.83	3.62	2.50
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of output	VOP (Rs.)	1,358	1,951	1,627	2,221	3,034	2,590
	CGR (%)	1.93	10.08	5.73	2.93	6.20	5.79
Yield (qtl/ha)		6.95	7.75	7.32	12.72	14.24	13.41
Profit (VOP-C2)		−643	−370	−519	−1,535	−1,287	−1,423
Number of years profit realised		0/6	1/5	1/11	0/6	0/5	0/11

Notes and Sources Same as in Table 5.2

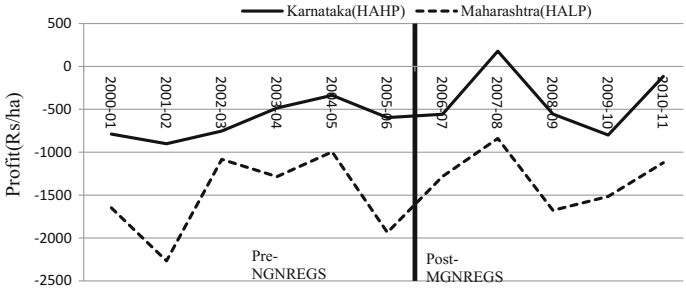

Fig. 5.3 Profitability in Jowar cultivation at 1986–87 price

5.3.4 Profitability in Gram

After studying the profitability of three cereal crops, the focus is turned towards the pulse crops which accounted for about 13% (24.46 million ha) of the cropped area as of 2011–12 in India. Although various pulse crops have been traditionally cultivated in India, two major pulse crops namely gram (Bengal gram) and tur (red gram) have been considered for the purpose of analysis as these two crops together accounted for about 52% of India's total pulses area in 2011–12.

Since gram and tur are different in many ways, it is not prudent to analyse the profitability of these two crops together. Therefore, here profitability of Gram analysed first and then tur. As followed earlier, two states namely Madhya Pradesh (HAHP state) and Rajasthan (HALP state) have been considered for the study. It clearly emerges from Table 5.5 that the cost incurred and profit realised from gram is not the same between the two states. In the case of HAHP state, the cost on human labour has increased substantially after the introduction of employment scheme. The real human labour cost grew at a rate of 4.36% per annum during post-MGNREGS period, but the same grew at a negative rate of −1.58% per annum during pre-MGNREGS period, suggesting a fast increase of human labour cost after the employment scheme.

However, the machine labour cost has surprisingly not increased substantially during post-MGNREGS period (2.87%) as compared to its previous period (2.81%). Because of negative growth in bullock labour cost as well as in the cost of yield increasing inputs, the gross cost of cultivation on gram has declined at a rate of −3.88% per annum during post-MGNREGS period.

As regards the profitability, although the average value of output has increased to ₹ 4,730/ha during post-MGNREGS period from its pre-MGNREGS period value of ₹ 4,397/ha, the growth rate of VOP during post-MGNREGS period was negative (−6.67% per annum). Notwithstanding this, the average profit realised by the farmers belonging to HAHP state during post-MGNREGS period increased to ₹ 1,034/ha, which was only about ₹ 800/ha during its previous period.

It was expected that the pattern of operation-wise cost of cultivation and profitability of gram in HALP state would be different from that of HAHP state. But the

Table 5.5 Cost and profitability of gram cultivation from 2000–01 to 2010–11 (values in ₹ at 1986–87 prices)

Costs/Profit	Particulars	Madhya Pradesh (HAHP)			Rajasthan (HALP)		
		2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11	2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11
Human labour	Cost (Rs.)	552	587	568	815	725	774
	CGR (%)	−1.58	4.36	0.45	−3.92	4.41	−1.02
	Share (%)	15.35	15.87	15.59	26.77	23.56	25.30
Bullock labour	Cost (Rs.)	201	113	161	155	88	125
	CGR (%)	1.02	−10.78	−7.48	−9.45	−27.15	−19.78
	Share (%)	5.60	3.06	4.43	5.11	2.86	4.08
Machine labour	Cost (Rs.)	338	450	389	316	320	318
	CGR (%)	2.81	2.87	3.64	1.25	0.64	0.23
	Share (%)	9.38	12.18	10.67	10.39	10.40	10.39
Yield enhancing inputs	Cost (Rs.)	882	914	897	672	748	707
	CGR (%)	2.22	−7.26	−1.49	3.20	−15.20	−3.57
	Share (%)	24.53	24.72	24.62	22.09	24.30	1,137
Other cost (fixed costs)	Cost (Rs.)	1,624	1,632	1,628	1,086	1,197	3,060
	CGR (%)	1.83	−6.16	−1.66	0.51	−10.22	−2.74
	Share (%)	45.14	44.16	44.69	35.68	38.88	37.14
Cost C2	Cost (Rs.)	3,597	3,696	3,642	3,044	3,079	3,060
	CGR (%)	1.44	−3.88	−0.85	−0.38	−7.24	−2.53
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of output	VOP (Rs.)	4,397	4,730	4,548	3,631	4,102	3,845
	CGR (%)	2.14	−6.67	−1.09	−0.42	−11.71	−3.19
Yield (qtl/ha)		9.89	10.08	9.98	6.62	8.25	7.36
Profit (VOP-C2)		800	1,034	906	587	1,023	785
Number of years profit realised		6/6	5/5	11/11	6/6	5/5	11/11

Notes and Sources Same as in Table 5.2

results presented in Table 5.5 depict not much difference in profit and other major parameters. Similar to HAHP state, the cost of human labour has increased at a faster rate during post-MGNREGS period as compared to its previous period. The growth in gross cost of cultivation (C2) has sharply declined during post-MGNREGS period, which was also observed with HAHP state. Due to the increase in yield of gram from 6.62 to 8.25 qtl/ha between the two periods, the profitability has increased from ₹ 587 to ₹ 1,023/ha between pre and post-MGNREGS period.

Again the increase in profitability in gram cultivation between HAHP state and HALP state is more or less same after the introduction of employment scheme (Fig. 5.4). The number of years profit realised by the farmers through the cultivation of gram is also same for both the states selected for the analysis. It appears

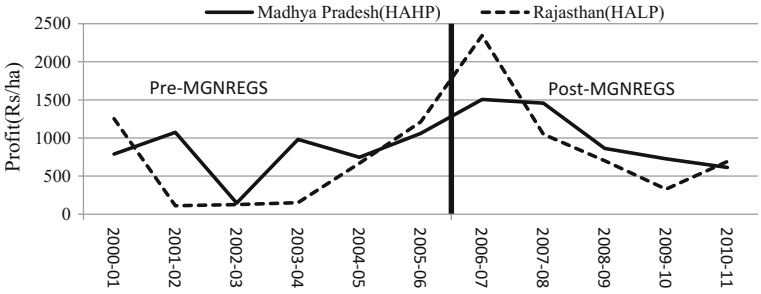

Fig. 5.4 Profitability in gram cultivation at 1986–87 price

from the analysis that although the human labour cost has increased at a faster rate after the introduction of national employment scheme, it has not made any severe impact on the profitability of gram in both HAHP and HALP.

5.3.5 Profitability in Tur

As mentioned earlier, tur is another important pulse crop selected for the analysis along with gram. Tur is cultivated predominantly under rainfed condition in various parts of India. Because of increased demand for tur, its area increased from 2.43 million ha in 1960–61 to 4.01 million ha in 2011–12, an increase of about 65%.

But, its productivity has not increased appreciably despite various efforts taken by the government which has been a serious concern among the policy makers.[4] In order to study the profitability of tur crop during pre and post-MGNREGS period, two states namely Maharashtra (HAHP state) and Karnataka (HALP state) have been considered as these two are cultivating tur under large area over the years. In fact, about 50% of India's total tur crop area was found only from these two states during 2011–12.

Given the variation in productivity of tur between the two states selected for the analysis, it is expected that the profitability would also be different among them. It is evident from Table 5.6 that the cost of human labour has increased substantially in HAHP state after the introduction of the NREGS. Not only has the average of cost of human labour increased from ₹ 1,082 to ₹ 1,827/ha between the two periods but its growth also registered at a high rate of 14.08% per annum during post-MGNREGS period, which is much higher the same registered during pre-MGNREGS period (7.23%).

[4]Considering the increased demand for tur, the government of India has substantially increased its minimum support price (MSP) especially in the recent years. The MSP announced for tur was only Rs. 1,105 per quintal during 1999–2000, but it increased to Rs. 3,850 per quintal during 2012–13. The hike in MSP for tur crop is very high as compared to many important foodgrain crops cultivated in India.

Table 5.6 Cost and profitability of tur cultivation from 2000–01 to 2010–11 (values in ₹ at 1986–87 prices)

Costs/Profit	Particulars	Maharashtra (HAHP)			Karnataka (HALP)		
		2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11	2000–01 to 2005–06	2006–07 to 2010–11	2000–01 to 2010–11
Human labour	Cost (Rs.)	1,082	1,827	1,421	709	972	828
	CGR (%)	7.23	14.08	9.78	4.89	12.03	6.23
	Share (%)	26.66	28.65	27.78	23.17	27.39	25.24
Bullock labour	Cost (Rs.)	879	1,178	1,015	438	347	397
	CGR (%)	26.37	−4.72	11.47	9.34	−10.08	−1.37
	Share (%)	21.65	18.47	19.85	14.33	9.77	12.09
Machine labour	Cost (Rs.)	137	320	221	183	223	202
	CGR (%)	14.40	19.98	17.25	4.53	29.24	9.50
	Share (%)	3.38	5.02	4.31	6.00	6.30	6.14
Yield enhancing inputs	Cost (Rs.)	471	970	698	783	751	768
	CGR (%)	11.71	14.82	13.63	−0.87	−0.93	0.74
	Share (%)	11.60	15.20	13.64	25.61	21.14	23.42
Other cost (fixed costs)	Cost (Rs.)	1,490	2,083	1,760	945	1,257	1,087
	CGR (%)	5.42	9.37	6.33	5.01	5.45	4.06
	Share (%)	36.72	32.65	34.41	30.89	35.40	33.11
Cost C2	Cost (Rs.)	4,058	6,379	5,113	3,058	3,550	3,282
	CGR (%)	10.45	9.19	9.63	4.07	5.33	3.78
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of output	VOP (Rs.)	4,671	7,314	5,872	3,098	4,622	3,791
	CGR (%)	8.04	9.55	7.85	7.11	8.01	5.70
Yield (qtl/ha)		9.81	11.33	759	6.01	7.08	6.50
Profit (VOP-C2)		612	935	247	40	1,072	509
Number of years profit realised		6/6	4/5	10/11	3/6	5/5	8/11

Notes and Sources Same as in Table 5.2

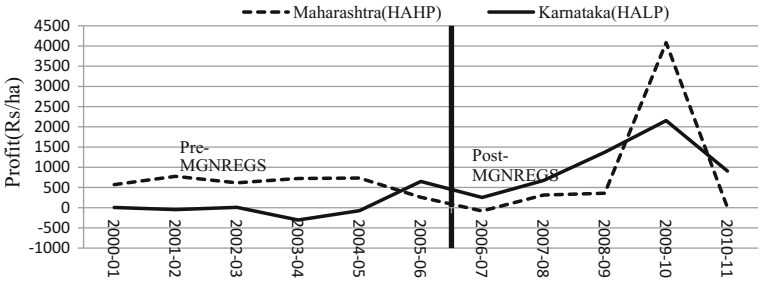

Fig. 5.5 Profitability in tur cultivation at 1986–87 price

Interestingly, this substantial increase in labour cost is seen in spite of considerable increase in the machine labour cost (19.98% per annum) during post-MGNREGS period. This kind of faster growth in labour cost has not been observed in any of the crops analysed so far.

Along with the labour cost, the costs of yield increasing inputs have also increased considerably during post-MGNREGS period which resulted in increased gross cost of cultivation (C2) between the two periods; increased from ₹ 4,058 to ₹ 6,379/ha. But, this steep increase in cost C2 has not affected the profitability of tur which in fact has increased from ₹ 612 to ₹ 935/ha between the two periods mainly because of increased value of output. One can say certainly from the analysis that the profitability of tur in HAHP state would have been much better if the cost of human labour has not increased substantially after the introduction of MGNREGS.

It is expected that the cost of cultivation and profitability of tur in HALP state would be totally different from that of HAHP state because of variation in productivity. But both the cost of human labour and the machine labour have increased at a pace which is almost similar to HAHP state (Table 5.6). While the human labour cost grew at a rate of 12.03% per annum during post-MGNREGS period, the same grew only at about 4.50% per annum during pre-MGNREGS period.

The cost of yield increasing inputs registered negative growth during both periods of analysis in HALP state which is different from HAHP state. However, despite a considerable increase in gross cost of cultivation, the profitability of tur has increased from ₹ 40 to ₹ 1,072/ha between the two periods in HALP state. Increased value of output and the slower increase in the gross cost of cultivation have helped the farmers cultivating tur to realise better profit during post-MGNREGS period (Fig. 5.5).

5.4 Conclusions and Suggestions

An attempt has been made in this study to analyse the impact of MGNREGS on the profitability of five foodgrain crops utilising cost of cultivation survey data from 2000–01 to 2010–11 covering different states. The results of the study have shown

mixed results; not completely supported the argument that the profitability of crops has declined after the introduction of NRGES. This is not only true with HAHP states but also with HALP states.

Supporting the earlier studies that the farm wage rate has increased due to the introduction of employment scheme, this study results also showed that the real cost of human labour has increased considerably in all five crops in both HAHP and HALP states after its introduction (2006–07 to 2010–11).

However, it has not made any deleterious impact on the profitability. The profitability, which is calculated by deducting the value of output from cost C2, has increased in all five crops in HAHP states, whereas either the profitability has increased or the losses reduced in HALP states. Besides, the number of years profit realised by the farmers have also increased in most crops during the post-MGNREGS period as compared to pre-MGNREGS period (2000–01 to 2005–06).

While there is no distinct pattern emerging in profitability between cereals and pulse crops, the level of increase in profitability is found to be relatively better among the pulse crops after the introduction of NRGES. Increased productivity in most crops has one way or the other helped to negate the increase in human labour cost which also facilitated to increase profitability.

Although there is no clear evidence from this study that the profitability of crops has declined during post-MGNREGS period, this may not be true in all regions/states in India. Regions where the employment scheme have been operated intensively may have increased the farm wage rate at a faster rate which might have affected the profitability of crops.

It is difficult to capture this effect through the cost of cultivation survey data which is used in this study. Detailed studies using farm level collected from different regions need to be carried out to verify the results of this study. The study finds that wherever the productivity of crop has increased during post-MGNREGS period, the profitability has not been affected despite considerable increase in human labour cost. Therefore, concerted efforts are needed to increase the productivity of crops and then the gross value of output to negate the cost increase in human labour.

This study clearly reveals that the gross cost of cultivation (C2) has increased substantially in most crops as compared to the increase that is observed in value of output in both HAHP and HALP states after the launch of rural employment programme. Farmers would have earned appreciable profit during post-MGNREGS period, if the cost of human labour had not increased appreciably.

The relatively less increase in the value of output in most crops suggests that the farmers are not getting the price for their produce in consonance with cost of cultivation. The National Commission on Farmers has suggested that the government should announce the minimum support price (MSP) for crops at 50% more than the actual cost of production (Cost C3). Minimum support prices announced every year for various crops should also be linked with the wholesale price index so as to protect the farmers from the possible inflationary pressure.

The cost of human labour incurred for cultivating different crops in south Indian states like Andhra Pradesh and Karnataka has registered high growth rate as compared to other selected states especially after the introduction of MGNREGS. This has either dampened the profitability of the crop or created losses for farmers in relation to cost C2. One needs to find out as to why have these happened specifically in south Indian states? Is it due to labour scarcity that was accentuated by the proper implementation of rural employment programme in these states?

The Mohan Kanda Committee (GoAP 2011) appointed for studying the reasons for crop holiday in East Godavari region in Andhra Pradesh pointed out that 'Non-availability of labour in the peak season of agricultural operation on account of MGNREGS' as one of the reasons for the distress call made by the farmers. Our analysis based on the cost of cultivation survey data also seems to indicate that the labour scarcity accentuated due to MGNREGS may have increased the cost of human labour at a faster pace. Therefore, arrangements may be made to link up MGNREGS with agricultural operations to reduce the labour scarcity and also to improve the profitability in crops cultivation.

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Appendix Note 1

CACP has been using nine different cost concepts. These are the followings:

(a) Cost A1 = All actual expenses in cash and kind incurred in production by owner.
(b) Cost A2 = Cost A1 + rent paid for leased-in land.
(c) Cost A2 + FL = Cost A2 + imputed value of family labour.
(d) Cost B1 = Cost A1 + interest on value of owned capital assets (excluding land).
(e) Cost B2 = Cost B1 + rental value of owned land (net of land revenue) and rent paid for leased-in land.
(f) Cost C1 = Cost B1 + imputed value of family labour.
(g) Cost C2 = Cost B2 + imputed value of family labour.
(h) Cost C2* = Cost C2 estimated by taking into account statutory minimum or actual wage whichever is higher.

(i) Cost C3 = Cost C2* + 10% of cost C2* on account of managerial.
(j) Functions performed by farmer.

Source Narayanamoorthy (2013).

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