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Has MGNREGS affected the Farmers Profitability? An Assessment based on Cost of Cultivation Data

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Abstract

It is often argued that the national rural employment guarantee scheme (MGNREGS) introduced during 2006 has increased the farm wage rate substantially that resulted in sharp reduction in farmers' profitability. Is there any substance in this argument? In this paper, we have done an attempt to specifically study this issue utilizing data series of cost of cultivation survey data available for different crops published by the Commission for Agricultural Costs and Prices. Utilizing these cost of cultivation data from 2000-01 to 2010-11, we have analyzed impacts of MGNREGS on farm profitability. We have included here nine different crops namely paddy, wheat, sorghum, chick pea, pigeon pea, rapeseed and mustard, groundnut, sugarcane and cotton for the analysis. As the productivity of crop often determines its profitability, two states for each crop, one each from the category of high area with high productivity (HAHP) and another one from high area with low productivity (HALP), have been considered for the analysis. The results of the study have not completely supported the argument that the profitability of crops has declined after the introduction of MGNREGS in 2006. This is not only true with HAHP states but also with HALP states. However, this study showed that the real cost incurred on account of human labor has increased considerably in eight out of nine crops in both HAHP and HALP states after the introduction of MGNREGS (2006-07 to 2010-11). But, the increase in labor cost has not made any deleterious impact on the profitability. The profitability calculated by deducting the value of output from cost C2 has increased in eight out of nine crops in HAHP states, whereas the profitability has either increased or the losses reduced in all nine crops in HALP states. Not only the average profit of most crops has increased but the number of years profit realized by the farmers has 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 food grain and non-food grain crops, the level of increase in profitability is found to be relatively better among the non-food grain crops after the introduction of MGNRGES. Increased productivity in most crops considered for the analysis has one way, or the other, helped to negate the increase in human labor cost and facilitated to increase the profitability.

Keywords: Cost of cultivation, Farm profitability, Indian agriculture, MGNREGS, Productivity of Crops.

JEL classification: **J 10; Q 12; Q18; I 32, and I 38**

Contents

Acronyms

AP	Andhra Pradesh
CACP	Commission for Agricultural Costs and Prices
CGIAR	Consultative Group on International Agricultural Research
CGR	Compound Growth Rate
CPIAL	Consumer Price Index for Agricultural Laborers
GoAP	Government of Andhra Pradesh
ha	Hectare
HAHP	High Area with High Productivity
HALP	High Area with Low Productivity
ICRISAT	International Crop Research Institute for Semi-Arid Tropics
Kg	Kilo gram
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MoA	Ministry of Agriculture
MoRD	Ministry of Rural Development
MP	Madhya Pradesh
MSP	Minimum Support Price
NREGA	National Rural Employment Guarantee Act
qtl	Quintal
R & M	Rapeseed and Mustard
Rs	Rupees
TE	Triennium Ending
VOP	Value of Output

Tables and Figures

1. Introduction

The major objective of this study is to systematically evaluate whether the Mahatma Gandhi national rural employment programme (MGNREGA) introduced during 2006 has affected the profitability of crops cultivated in different parts of India. Then, we also quantified the impact of MGNREGS on farm profitability. It is argued vehemently in different forums that "……MGNREGA has 'pushed' up the average wage of casual workers, distorted the rural labor markets by diverting them to non- farm rural jobs, thus creating an artificial labor shortage and raising the cost of production of agricultural commodities" (Gulati, et al., 2013, p.9). As a result of increased cost of production, the profitability from cultivating different crops reportedly has been reduced. A plethora of reports published in various vernacular dailies1 especially in south India have also indicated the issue of declining profitability due to the introduction of national rural employment scheme. Is this argument valid?

Very limited rigorous empirical analyses exist that systematically assess farmer's profitability in growing major crops covering at wider-scale. Therefore, we have attempted here to address to systematically address this important public policy concern by analyzing the structure of farmer's costs and profitability in cultivation of major crops as available from Cost of Cultivation data sources, representing for wider coverage of the country.

The Government of India has introduced an assured employment scheme to all rural households who are willing to work for manual work provided by the local government, by enacting constitutional act in 2006, namely the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)2 with a major objective of providing employment security to rural poor and vulnerable and reducing the rural poverty and rural distress. So far, over Rs. 200 thousands crore of Indian Rupees (or Indian Rs 2000 billion, or over USD40 billion3) has been spent on this programme in the last 6-7 years, since the program initiated in 2006. Until late 2012, this program has been able to generate about 13.48 billion person days of employment throughout India since its inception (MoRD, 2012; Gulati, et al., 2013). Considering the scale of public sector interventions, it is proper to assess the impact of MGNREGS not only on employment ad wage rate but what happen to the farmers' profitability in growing crops, and how farmers have been adjusting over the year. They are also the focus of this study.

[1] A large number of news reports have been published in various Tamil dailies such as *Dinamani, Dinamalar, Dina Thanthi, Dinakaran, Tamil The Hindu* covering the issue of NREGS's impact on farming 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 credible and popular news paper in Tamil, 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 on this same issue have also been published during 2013 and 2014 in various news papers.

[2] The terms such as NREGS and MGNREGS are interchangeably used in this paper, but they convey the same meaning.

[3] This is derived taking exchange rate of USD 1= Rs 50, at the prevailing exchange rate in 2010-11 (midpoint of the last 6-7 years) of forex exchange rate).

One of the objectives of MGNREGS is also to reduce the out migration of rural poor from rural to urban, and reduce poverty among the vulnerable sections by providing assured employment opportunities within the localities of these rural poor. Studies carried out on the impact of this scheme have shown that it helps getting the assured wage rate and employment in most of the states where it is implemented effectively (for recent review, see, Shah, 2009; Mukherjee and Sinha, 2011; Dutta, et al., 2012; MoRD, 2012; Mann and Ramesh, 2013).

This employment guarantee scheme was introduced specifically to improve the standard of living of the vulnerable sections of the rural population. But, it is increasingly argued that this scheme has been seriously affecting the growth of agricultural sector that has already been passing through a serious crisis since early 1990s because of increased cost of cultivation and poor remuneration from crops cultivated by smallholding farmers, especially in dry region where staple crops are more prominent (see, Harish et al. 2011; Narayanamoorthy and Alli, 2013; Gulati, et al., 2013). As this scheme is operated throughout the year, including in the busy seasons of agriculture, it has created unusually tightening of the labour market in the rural labor markets, which resulted in steep increase in the wage rate of agricultural laborers in many places (Shah, 2009; Dutta, et al., 2012; Berg, et al., 2012; Gulati, 2013).

In addition, some people have also argued that the introduction of MGNREGS has also reportedly deteriorated the quality of labour considerably, that is, the effective working hours of agricultural labour has reduced over the year, which is ultimately increasing the labour requirement for the given agricultural operation (Verma and Shah, 2012). Both the increased wage rate and requirement of more number of labour at the end will reportedly lead to increased cost of cultivation of the crops substantially, especially since the introduction of MGNREGS in 2006 (Chandrasekar and Ghosh, 2011).

As the output prices are not fixed in consonance with the rise in cost of cultivation in India, as a result, the losses to farmers from crops cultivation reportedly might have increased over the years. Importantly, citing increased wage rate due to MGNREGS in agriculture, farmers belonging to fertile region of Andhra Pradesh have even declared ‘paddy crop holiday’ in large area during kharif season 2011 (see, GoAP, 2011, Narayanamoorthy and Alli, 2012). Similarly, farmers organizations have been demanding for rise on Minimum Support Prices (MSP) of staple crops across different parts of the country, largely due to due to increased inputs cost, both materials as well as labor cost.

The farm wage rate and cost of cultivation are determined by irrigation coverage, available of labor pools in a region, and host of other factors which vary widely across the regions. Given the wide variation in determining factors, is it correct to say that the MGNREGS alone is the factor for increasing farm wage rate which results in increased cost of cultivation uniformly across different crops and states in India? Even if one accepts the argument that MGNREGS has led to increase the farm wage rate, will the impact of it on wage rate and cost of cultivation be the same across high and low irrigation intensity states? Limited studies have analyzed the implementation, equity and governance aspects of MGNREGS (Aiyar and Samji, 2006; Bhatia and Dreze, 2006; Gopal, 2009, Khera and Nayak, 2009; Adhikari and Bhatia, 2010; Jha, et al 2011)). Several studies have shown that the MGNREGS has been relatively successful since it is directly providing more employment

opportunities and wage to the poor in the rural areas (see, Imbert and Papp, 2011; Liu and Barrett, 2013; Dutta et al., 2012; MoRD, 2012). Although the employment guarantee scheme has multiplier impacts on village economy that also help in raising economy activities and the business opportunities in rural areas, all of these effects will obviously may also be expected to cause a hike in agricultural wages in a short-run, as demand for labor increased with limited supply of labor in a location (Berg, et al., 2012; Azam, 2011; and Hirway, et al., 2008).

Gulati et al., (2012) reported that by distorting the rural labour markets through creating an artificial labour shortage, the employment guarantee 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). Many vernacular dailies have also stressed the adverse effect of MGNREGS on agricultural labour supply, diversion of labor from agricultural work to non-farm work in rural area (road construction or canal drenching, etc) increase wages and costs of cultivation. Although a large number of studies have analyzed the impact of the employment guarantee scheme on employment structure and wage rate in particularly, not many studies are available that analyzed systematically on farmers profitability in cultivation of crops covering major states and major crop types of India.

Given the absence of detailed study based on macro-level data covering wider regions of country, one cannot come to a conclusion that MGNREGS has in fact reduced the profitability of the crops uniformly across states of India. Moreover, the surplus labour available in the irrigated regions is already less as compared to un-irrigated regions, and therefore, the impact of MGNREGS on cost of human labour is also not expected to be same between the two irrigated and rainfed regions, due to variation on cropping patterns and variation on level of labor supply position in the two regions. Besides, the irrigation coverage to cropped area, cropping pattern, intensity of crop cultivation, availability of labour and rural infrastructure facilities factors widely varied from one state to another and from one agro-economic environment to another. Thus, the farmers' profitability is also expected to vary by location, and is also a function of irrigation, infrastructure and other inputs used in farming (Vishandass and Lukka, 2013). Thus, accordingly, the impact of MGNREGS on profitability of growing crops also expected to be not the same across the states.

Objectives of the study

Considering the complex sets of factors affecting farmers profitability and incentives in growing a particular crop at appoint of time, and growing public policy discourse on reducing profit margin of farmers in growing major staple crops after implementation of the MGNREGA scheme in India, an attempt is made in this study to evaluate systematically impact of MGNREGS on the cost of cultivation, as well as farm profitability of growing different major crops. This has been done utilizing the vast level of cost of cultivation survey data across the crops and states. Thus, the main purpose of the study is to assess and

evaluate profitability of different crops before and after the introduction of MGNREGS4. In this context, the specific objectives of the study are:

1. To evaluate change in the level and cost of human labour used in different crops before and after the introduction of rural employment guarantee scheme (MGNREGS).

2. To compare and contrast the cost of major operations with human labour cost in cultivation of different crops before and after the introduction of rural employment guarantee scheme (MGNREGS).

3. To analyze the overall pattern and dynamics of changes on cost of cultivation in different crops before and after the introduction of rural employment guarantee scheme.

4. To estimate the profitability in different crops in relation to cost C25 type of farmers crops, before and after the introduction of rural employment guarantee scheme.

[4] MGNREGS, and NREGS, or NGREGA have been interchangeable used in this study, all are for same meaning indicating for the national employment guarantee program of the government of India that was launched nationwide in 2006.

[5] For this type of assessment, it is suggested that the Cost 2 (real cost of production) is the better category which takes care of hired labor cost as well as family supplied labor forces, which has also increased opportunity costs of labor wage market in the community.

2. Methodology, Analytical techniques, and Data

This study has been carried out by comparing dynamics of changing patterns of farmers costs and profitability by utilizing crop-wise cost of cultivation survey data compiled by Government of India national wide survey Scheme, covering period from 2000-01 to 2010-11. The Commission for Agricultural Costs and Prices (CACP) has been publishing valuable time series data on operation-wise costs of production of major crops across states and by range major crops, productivity of crops, farmers' income and profitability, etc., for various important crops and for long series of time period.

This cost of cultivation survey data is regarded as a very valuable information base on agricultural production costs, which is generally used in India for fixing the government minimum support prices for different crops for both kharif and rabi seasons.6 For analyzing the profitability of crops cultivation, all the costs and income related data have been compiled from various CACP's publications, and the data series that were published on its website.

Here, the labor the labour and other inputs required for the cultivation of different crops are not the same for all states, which is also expected to be varied in different states depending upon the intensity of crops cultivation and availability of labor pool, population dynamics, and other structural factors. . The intensity of input use in high productivity states will be totally different from the state that belongs to relatively low productivity for a crop. Profit level is also expected to be different for different crops (and different for different regions/states) because of the variation on labor market and output market conditions.

One of our 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 nine different crops (paddy, wheat, sorghum (sorghum), chickpeas (chick pea), pigeon peas (tur), rapeseed and mustard, groundnut, sugarcane and cotton) consisting of cereals, pulses, oilseeds and high value commercial crops have been considered for the study. Based on the productivity data of TE 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 details analysis on the variation on profitability of crops. The details of crops and the states selected for the analysis are presented in Table 1.

As regards the method of profit calculation, CACP has been using nine different cost concepts (they are A1, A2, A2+FL, B1, B2, C1, C2, C2* and C3) for measuring the economics of various crops cultivation. For this study, we have considered cost C2 as best for computing the profitability of various crops since it covers the entire variable costs as well as fixed costs needed for cultivation of the crop. Then, we evaluate whether or not the profitability level of growing different crops vary by the states, especially to see, whether the profitability has increased (or decreased) after the introduction of MGNREGS.

For this, all the costs and income related data have been converted into constant prices using CPIAL deflator at 1986-87 prices. Profit level of the crop is computed by deducting the cost C2 from the value of output. Although the study covers data pertaining to different crops

[6] For more details about the importance of cost of cultivation survey data see, www.cacp.dacnet.nic.in

from 2000-01 to 2010-11, 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 cost of cultivation and profitability.

Table 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)	3020	3114
	Odisha	HALP	4.48 (10.26)	4.35 (9.87)	1491	1577
2. Wheat	Punjab	HAHP	3.46 (13.10)	3.52 (12.07)	4202	4487
	Madhya Pradesh	HALP	3.97 (13.94)	4.13 (14.93)	1716	1816
3. Sorghum	Karnataka	HAHP	1.63 (17.53)	1.33 (16.80)	806	1129
	Maharashtra	HALP	4.65 (54.67)	4.10 (55.01)	745	862
4. Chickpeas	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. Pigeon peas	Maharashtra	HAHP	1.08 (30.73)	1.13 (29.75)	664	730
	Karnataka	HALP	0.57 (16.76)	0.70 (20.37)	539	529
6. R&M	Rajasthan	HAHP	3.16 (50.41)	2.94 (53.33)	1188	1233
	Madhya Pradesh	HALP	0.68 (11.13)	0.75 (10.87)	1039	1085
7. Groundnut	Gujarat	HAHP	1.99 (28.93)	1.85 (30.89)	1638	1408
	Andhra Pradesh	HALP	1.74 (27.89)	1.56 (27.56)	760	851
8. Sugarcane	Maharashtra	HAHP	0.42 (11.90)	0.83 (19.88)	66229	82900
	Uttar Pradesh	HALP	2.05 (51.43)	2.06 (43.65)	58159	56102
9. Cotton	Gujarat	HAHP	1.82 (22.00)	2.48 (23.40)	481	576
	Maharashtra	HALP	2.83 (33.18)	3.53 (35.05)	184	303

Notes: HAHP – High area with high productivity; HALP – High area with low productivity; Figures in brackets are percentage to India's total area; R&M – Rapeseed and Mustard; T E = *Triennium Ending;*
Sources: Computed utilizing data from MoA (2012) and www.dacnet.nic.in.

3. Analysis and Discussion

As reported earlier, this study covers nine different crops for its analysis. These nine 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 analyze the profitability of each crop separately rather than taking all the crops together. Let us first analyze the profitability of paddy crop before and after the introduction of MGNREGS.

3.1. Profitability in Paddy

Paddy is one among the important and labour-intensive crops cultivated most part 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 ultimately 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 rural employment scheme? What is the increase in labour cost vis-à-vis the costs of other operations? Can we say that the profitability is 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? We need to find out answer to these questions to make any judgment as to whether or not the rural employment has made any impact on the profitability of paddy crop.

Profitability of any crop is always related with its productivity, which is highlighted by many studies (see, Bhalla and Singh, 2012). Therefore, as mentioned in the methodology section, we have selected two states having the characteristics of high area with high productivity (HAHP) and high area with low productivity (HALP) for the analysis. While Andhra Pradesh has been considered as HAHP state, Odisha state has been selected as HALP state in paddy crop for the detailed analysis. Table 2 presents the trends in operation-wise cost, productivity, value of output and profit for paddy crops for the two selected states for both pre and post-MGNREGS periods. For the purpose of analysis, the operation-wise cost has been classified into five categories namely cost on human labour, cost on 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 the table 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 a serious issue widely discussed after the introduction of national rural employment programme. The cost of human labour has increased at a rate of 6.13 percent per annum in HAHP state during post-MGNREGS period, but the same grew at a negative rate of -1.84 percent during the pre-MGNREGS period. What is interesting here is that this has happened despite of significant increase in the cost of machine labour which grew at a rate of 7.50 percent per annum during post-MGNREGS period. It is generally expected 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 on 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 increased at a rate of 2.62 percent per annum during the post- MGNREGS period, which was not the case during pre-MGNREGS period.

Table 2: Cost and profitability of paddy cultivation from 2000-01 to 2010-11 (values in Indian Rs. at 1986-87 constant prices)

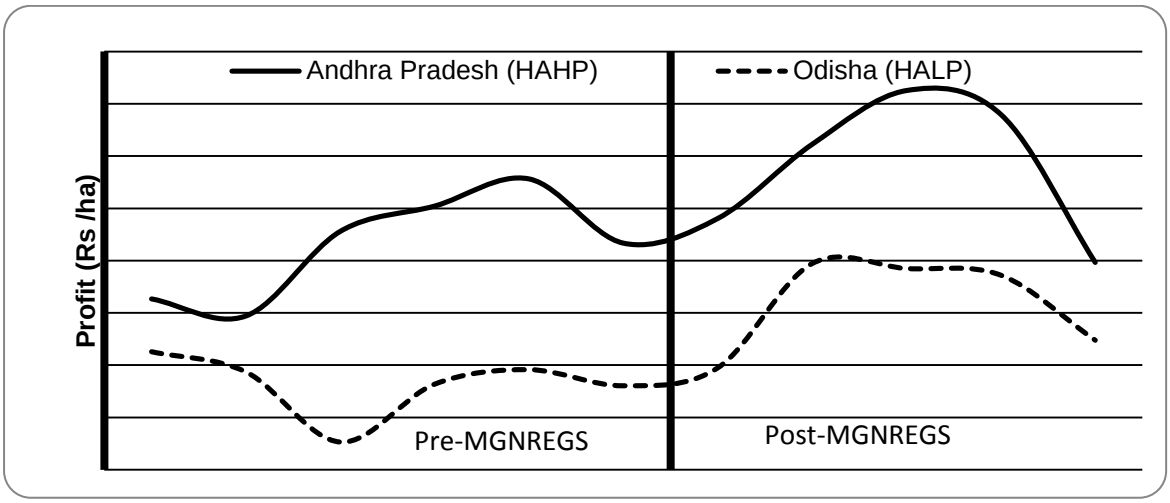
Costs/Profit	Particulars	Andhra Pradesh (HAHP)			Odisha (HALP)		
		2000-01 to 2005-06	2006-07 to 2010-11	2000-01 to 2010-11	2000-01 to 2005-06	2006-07 to 2010-11	2000-01 to 2010-11
Human	Cost(Rs)	2709	3157	2913	2034	2141	2083
Labour	CGR (%)	-1.84	6.13	1.33	1.05	4.19	2.18
	Share (%)	31.25	34.14	32.30	38.59	39.37	39.07
Bullock	Cost(Rs)	281	158	223	636	562	598
Labour	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	Cost(Rs)	550	851	705	121	153	136
Labour	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	Cost(Rs)	2005	1765	1850	850	766	806
Enhancing	CGR (%)	2.22	-2.17	-2.85	0.32	-2.96	-1.55
Inputs	Share (%)	23.13	19.09	20.52	16.12	14.22	15.12
Other Cost	Cost(Rs)	3220	3501	3381	1630	1786	1708
(fixed costs)	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)	8667	9248	9018	5271	5389	5331
	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	VOP(Rs)	8810	10030	9507	4088	4851	4501
Output	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	-1182	-538	-829
Number of years profit realized		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).

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, we have selected another state namely Odisha 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 on human labour in HALP state is 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 faster pace during the 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 percent per annum during post-MGNREGS period, but the same has increased only at a rate of 1.05 percent 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 the post-MGNREGS period because of 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.

As mentioned earlier, one of the major objectives of the study is to find out whether the profitability in crops cultivation has affected due to the introduction of rural employment scheme. 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. Though a few studies have corroborated that the agricultural wage rate increased due to the rural employment scheme, not many studies have analyzed the aspect of profitability. Therefore, after studying operation-wise cost of cultivation, we have turned our focus towards the profitability of paddy crop. It is known 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. With this understanding, let us study the profitability of paddy. The results presented in Table 2 show that the average value of paddy output increased from Rs. 8,810/ha in 2000-06 to Rs. 10,030/ha in 2006-11 in HAHP states, showing a much faster pace of growth rate during the post-MGNREGS period. As a result of the faster growth in VOP, the profitability from paddy increased from Rs. 143/ha to Rs.782/ha between the two time periods. Although the absolute profitability is very meagre, it increased manifold during the 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 realized by the farmers have also increased during the post-MGNREGS period in HAHP state (see, Figure 1).



Note: Average Annual Exchange Rate in 1986-87 is: 1 USD = Rs. 12.77
Source: Author's Estimation

Figure 1: Profitability in paddy cultivation at 1986-87 prices

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 has reduced from Rs. 1182/ha to Rs. 538/ha during this period. Surprisingly, the 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, the 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.

3.2. Profitability in Wheat

Wheat is an important food grain crop cultivated predominantly during rabi season in different parts of the country. It accounts for about 24 percent in India's total food grains area and about 37 percent in India's gross production of food grains during 2011-12. Similar to paddy crop, it is also cultivated mostly under irrigated conditions where the cost of cultivation is generally in higher; human labour cost accounts for about 10-17 percent 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, as mentioned in the methodology section, we have selected two states having the characteristics of high area with high productivity (HAHP) and high area with low productivity (HALP). Punjab, which is way ahead in productivity of wheat among the states in India, has been considered as HAHP state, while Madhya Pradesh (MP) has been selected as HALP state for the analysis.

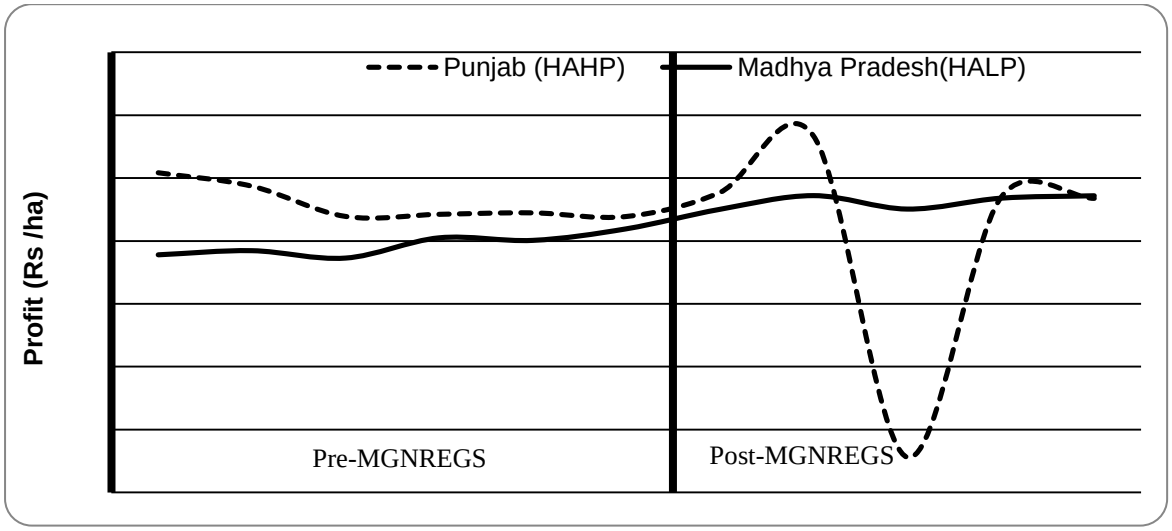
Table 3: Cost and profitability of wheat cultivation from 2000-01 to 2010-11. (values in Rs. are at 1986-87 prices)

Costs/Profit	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)	1064	1169	1112	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)	1665	1394	1542	1202	1180	1192
	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)	3736	4348	4014	1762	2272	1994
	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)	7249	7773	7487	4366	4989	4649
	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)	8450	7918	8209	4234	6240	5146
	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)		1202	1887	1513	-132.19	1251.37	496.70
Number of years profit realized		6/6	5/5	11/11	3/6	5/5	8/11

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).

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 3. Let us first study the pattern of profitability and others in HAHP state. We have expected that the human labour cost would have gone up considerably after the introduction of MGNRES in wheat

crop. But against our expectation, the human labour cost has increased only marginally after the introduction of employment scheme. For instance, the average human labour cost during pre-MGNREGS period was Rs. 757/ha, which increased to Rs. 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 percent) during post-MGNREGS period as compared to its previous period (-1.00 percent). This happened despite deceleration in the cost of machine labour during the post-MGNREGS period. Interestingly, the real cost of all other operations has also decelerated during the 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 that we probed in our study. As per the data of CACP, the gross cost of cultivation (C2) has increased marginally from Rs.7249/ha to Rs. 7773/ha in between 2000-06 and 20006-11 in Punjab. But, in spite of marginal increase in cost C2, the profitability from wheat cultivation has increased from Rs. 1202/ha to Rs. 1887/ha during this period.



Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Indian Rs. 12.77
Source: Author's estimation

Figure 2 Profitability in wheat cultivation at 1986-87 prices

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 percent), the human labour cost spent for the cultivation of wheat has increased at a rate of 1.01 percent per annum during this period. This is different from the results that have 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 different states because the factors determining the wage cost/rate 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/ha to Rs. 1251/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 qtl/ha to 24.81 qtl/ha between the two periods considered for the analysis. 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 realized by the farmers have increased after its introduction (see, Figure 2).

3.3. Profitability in Sorghum

Sorghum is another food grain crop we have considered for the analysis for two reasons. First, unlike paddy and wheat crops, sorghum is cultivated predominantly under rainfed condition.7 Second, it is generally treated as a low value crop in comparison to paddy and wheat crops. Therefore, studying the profitability of this crop would give some interesting results that will be useful to compare with other high value crops. As followed earlier, two states namely Karnataka and Maharashtra have been considered for the analysis of sorghum crop. While Karnataka has been selected as HAHP state, Maharashtra has been considered as HALP state for the purpose of analysis.

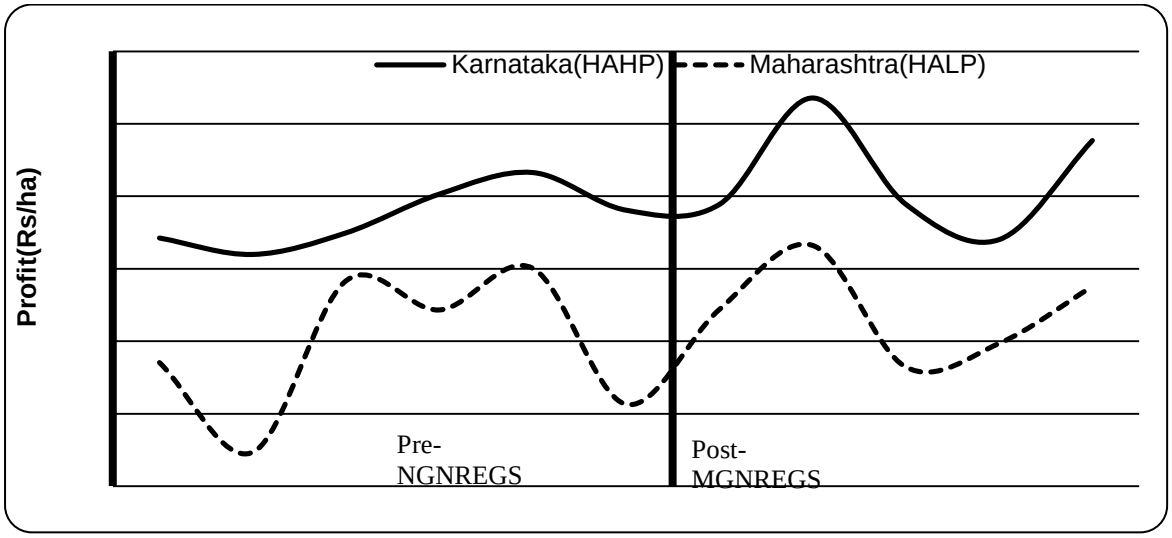
[7] The coverage of irrigation in sorghum crop is very low in India; it increased only from 3.60 percent in 1960-61 to 8.70 in 2011-12. This is very low when compared to the crops like paddy and wheat where the coverage of irrigation is 58.60 percent and 92.10 percent respectively during 2010-11.

Table 4: Cost and profitability of sorghum cultivation from 2000-01 to 2010-11 (values in Rs. are 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	1055	1240	1139
	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	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	1068	1323	1184
	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)	2001	2321	2146	3756	4321	4013
	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)	1358	1951	1627	2221	3034	2590
	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	-1535	-1287	-1423
No. of years profit realised		0/6	1/5	1/11	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).

Let us first analyse the profitability of sorghum by taking the data of HAHP state. It is evident from Table 4 that the cost of human labour incurred for cultivating sorghum has increased at a faster rate after the introduction of MGNRGES. The real human labour cost increased at a rate of 10.24 percent per annum from 2006-07 to 2010-11, whereas the same was almost constant (0.01 percent) during pre-MGNRGES period. In terms of value, an on average Rs. 850/ha was incurred on account of human labour during post- MGNRGES period which was only Rs. 567/ha during pre-MGNRGES period. It is expected that the machine labour cost would be less where 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 percent/annum) after the introduction of employment scheme in Karnataka which is an interesting result.



Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Indian Rs. 12.77
Source: Author's Estimation

Figure 3: Profitability in sorghum cultivation at 1986-87 prices

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 percent/annum during the post- MGNRGES period as against the negative rate of -0.31 percent/annum during pre- MGNRGES period. However, the increased labour cost as well as the gross cost (C2) has not made any big impact on the profitability of sorghum in HAHP state; the average profit in relation to cost C2 was negative during both pre and post-MGNRGES periods. Although the employment scheme has increased the cost of cultivation in sorghum, but it has not made any significant damages on its profitability (see, Figure 3).

The profitability of sorghum in HALP state (Maharashtra) is somewhat different from its counterpart state of HAHP. The results generated from the data of CACP show that the real human labour cost increased at a rate of 8.70 percent/annum during post-MGNRGES period as against the negative growth of -1.44 percent during pre-MGNRGES period. This is almost matching with the result of HAHP state. The cost on machine labour too increased at an appreciable rate (6.66 percent) during post-MGNRGES period which also increased at a rate of 7.49 percent/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 percent/annum, which is little lower (2.83 percent) 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 periods have not made any impact on the profitability of sorghum. Profitability is found to be negative at both periods considered for the analysis. The only difference that is noted between the two periods is the magnitude of losses (in relation cost C2) incurred by sorghum farmers is relatively less during post-MGNREGS period as compared to pre-MGNRGES period.

3.4. Profitability in Chick pea

After studying the profitability of three cereal crops, we have turned our focus on the pulse crops which accounts for about 13 percent (24.46 million hectares) of cropped area as of 2011-12 in India. Although various pulse crops have been traditionally cultivated in India, two major pulse crops namely chick pea (Bengal gram) and pigeon pea (red gram) have been considered for the purpose of analysis as these two crops together accounted for about 52 percent of India's total pulses area in 2011-12.

From the pulse, we have taken chick pea as the first crop for the analysis. As followed earlier, two states namely Madhya Pradesh (HAHP state) and Rajasthan (HALP state) have been considered for the study. It emerges clear from Table 5 that the cost incurred and profit realized from chick pea 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 percent/annum during post-MGNREGS period, but the same grew at a negative rate of -1.58 percent/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 percent) as compared to its previous period (2.81 percent). Because of negative growth in bullock labour cost as well as in the cost of yield increasing inputs, the gross cost of cultivation on chick pea has declined at a rate of -3.88 percent/annum during post-MGNREGS period. As regards the profitability, although the average value of output has increased to Rs.4730/ha during post-MGNREGS period from its pre-MGNREGS period value of Rs. 4397/ha, the growth rate of VOP during post-MGNREGS period was negative (-6.67 percent/annum). Notwithstanding this, the average profit realized by the farmers belonging to HAHP state during post-MGNREGS period increased to Rs. 1034/ha, which was only about Rs. 800/ha during its previous period.

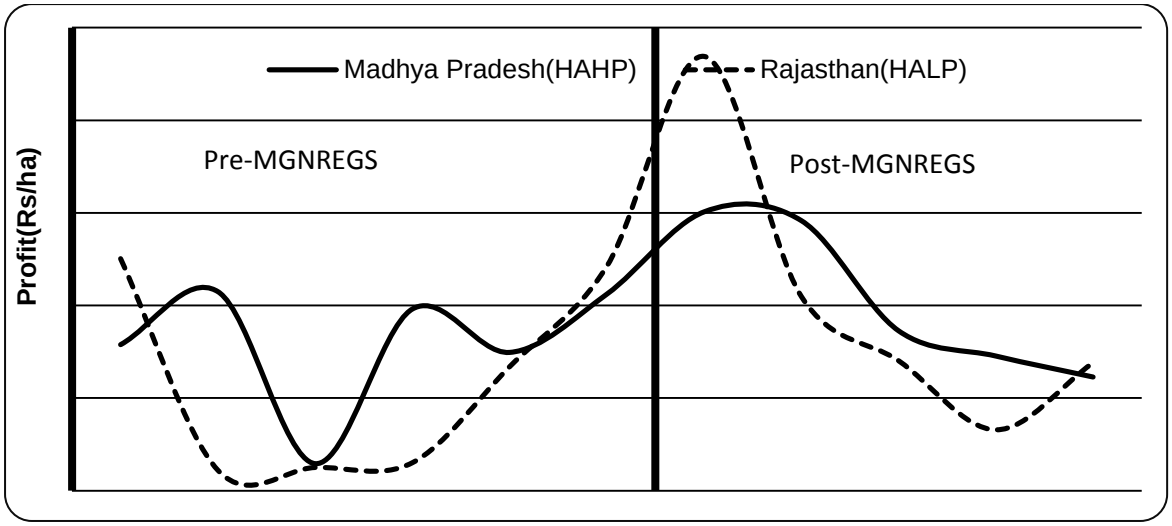
Table 5: Cost and profitability of chick pea cultivation from 2000-01 to 2010-11. (Values in Rs. are at 1986-87 prices)

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	Cost(Rs)	882	914	897	672	748	707
Inputs	CGR (%)	2.22	-7.26	-1.49	3.20	-15.20	-3.57
	Share (%)	24.53	24.72	24.62	22.09	24.30	1137
Other cost	Cost(Rs)	1624	1632	1628	1086	1197	3060
(fixed costs)	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)	3597	3696	3642	3044	3079	3060
	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)	4397	4730	4548	3631	4102	3845
	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	1034	906	587	1023	785
Number of years profit realized		6/6	5/5	11/11	6/6	5/5	11/11

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).

It was expected that the pattern of operation-wise cost of cultivation and profitability of chick pea in HALP state would be different from that of HAHP state. But the results presented in Table 5 depict not much difference in profit and other major parameters. Similar to HAHP state, the cost on 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 chick pea from 6.62 qtl/ha to 8.25 qtl/ha between the two periods, the profitability has increased from Rs. 587/ha to Rs. 1023/ha between pre and post-MGNREGS period. Again the increase in profitability in chick pea cultivation between HAHP state and HALP state is more or less same after the introduction of employment scheme (see, Figure 4). The number of years profit realised by the farmers through the cultivation of chick pea are also same for both the states selected for the analysis. It appears from the analysis that although the human labour cost has increased at a faster rate after the introduction of

national employment scheme, the profitability of chick pea has not been affected in both HAHP and HALP.



Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Indian Rs. 12.77
Source: Author's Estimation

Figure 4: Profitability in gram cultivation at 1986-87 prices

3.5. Profitability in Pigeon pea

As mentioned earlier, pigeon pea is another important pulse crop we have selected for analysis along with chick pea. Pigeon pea is cultivated predominantly under rainfed condition in various parts of India. Because of increased demand for pigeon pea, its area increased from 2.43 mha in 1960-61 to 4.01 mha in 2011-12, an increase of about 65 percent. But, its productivity has not increased appreciably despite various efforts taken by the government which has been a serious concern among the policy makers.8 In order to study the profitability of pigeon pea 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 pigeon pea covering large area over the years; these two states together accounted for about 50 percent of India's total pigeon pea crop area during 2011-12.

Given the variation in productivity of pigeon pea between the two states selected for the analysis, it is expected that the profitability would also be different among them. Now let us find out whether or not our expectation on profitability of pigeon pea is correct. It is evident from Table 6, which presents the details of selected operation-wise cost, gross cost of cultivation and profitability of pigeon pea that the cost of human labour has increased substantially in HAHP state after the introduction of the national rural employment scheme. Not only the average of cost of human labour has increased from Rs. 1082/ha to Rs. 1827/ha between the two periods but its growth also registered at a whooping rate of 14.08 percent/annum during post-MGNREGS period, which is much higher the same registered

[8] 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. 1105 per quintal during 1999-2000, but it increased to Rs. 3850 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.

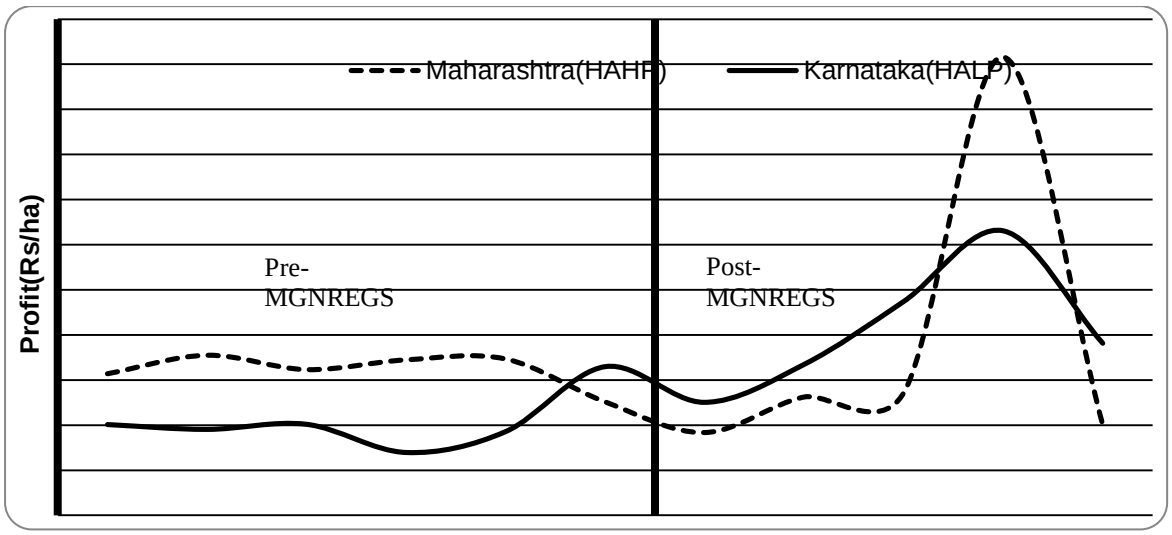
during pre-MGNREGS period (7.23 percent). Interestingly, this substantial increase in labour cost is seen in spite of considerable increase in the machine labour cost (19.98 percent/annum) during post-MGNREGS period. This kind of faster growth in labour cost has not been observed in any of the crops we have analyzed so far. Along with the labour cost, the costs on yield increasing inputs have also increased considerably during the post-MGNREGS period which resulted in increased gross cost of cultivation (C2) between the two periods; increased from Rs. 4058/ha to Rs. 6379/ha. But, this steep increase in cost C2 has not affected the profitability of pigeon pea which in fact has increased from Rs. 612/ha to Rs. 935/ha between the two periods mainly because of increased value of output. One can say certainly from the analysis that the profitability of pigeon pea in HAHP state would have been much better if the cost of human labour has not increased substantially after the introduction of MGNREGS.

Table 6: Cost and profitability of pigeon pea cultivation from 2000-01 to 2010-11(values in Rs. are 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)	1082	1827	1421	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	1178	1015	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)	1490	2083	1760	945	1257	1087
	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)	4058	6379	5113	3058	3550	3282
	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)	4671	7314	5872	3098	4622	3791
	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	1072	509
Number of years profit realised		6/6	4/5	10/11	3/6	5/5	8/11

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).

We have expected the cost of cultivation and profitability of pigeon pea in HALP state would be totally different from that of HAHP state because of variation in productivity. But to our surprise both the cost of human labour and the machine labour have increased at a pace which is almost similar to HAHP state (see, Table 6). While the human labour cost grew at a rate of 12.03 percent/annum and machine labour at 29.24 percent/annum during post-MGNREGS period, the same grew only at about 4.50 percent per annum during pre-MGNREGS period. The costs of yield increasing inputs registered negative growth during both periods of analysis in HALP state which is different from HAHP state. However, despite considerable increase in gross cost of cultivation, the profitability of pigeon pea has increased from Rs. 40/ha to Rs.1072/ha between the two periods in HALP state. Increased value of output and the slower increase in gross cost of cultivation have helped the farmers to realise better profit during post-MGNREGS period (see, Figure 5).



Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Indian Rs. 12.77
Source: Author's Estimation

Figure 5: Profitability in pigeon pea cultivation at 1986-87 prices

3.6. Profitability in Rapeseed and Mustard

Oilseed crops occupy an important place in India's cropping pattern over the years. Though oilseed crops are treated as high value commercial crops, it is mostly cultivated under less irrigated or rainfed condition in India.9 Because of increased demand for oilseed crops and continuous patronage provided by the government through increased minimum support price, the area under the oilseed crops has increased from 13.77 mha in 1960-61 to 26.53 mha in 2012-13, an increase of about 93 percent. For the purpose of studying the profitability of oilseed crops, we have selected two major crops namely rapeseed and mustard (hereafter RM) and groundnut. Of this, the coverage of irrigation is presently higher with RM (close to 70 percent), but it is very low with groundnut (only about 22 percent). Therefore, studying

[9] Though the coverage of irrigation in oilseed crops has increased from 3.30 percent in 1960-61 to 25.10 percent in 2011-12, its coverage is very low in relation to paddy (58.60 percent) and wheat (92.10 percent) as of today. Low coverage of irrigation could be one of the main reasons for low productivity in most oilseed crops in India.

these two different crops would provide interesting comparative perspective on the profitability of oilseed crops.

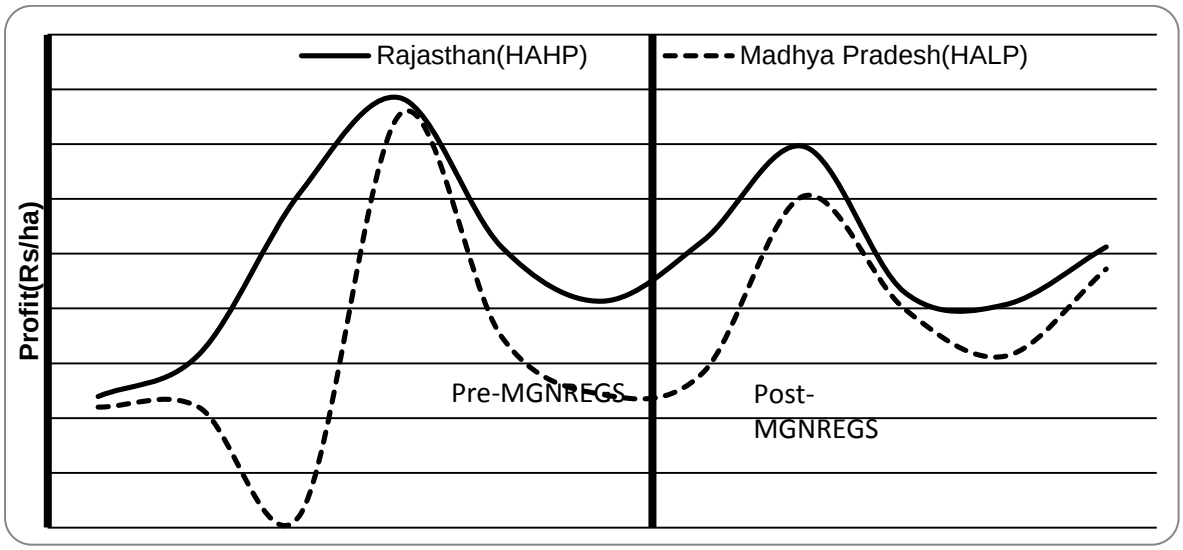
Let us first analyze the profitability of RM crop for which two states namely Rajasthan as HAHP state and Madhya Pradesh as HALP state have been selected. As per the data of 2012-13, Rajasthan and MP accounted for about 66 percent of India's total RM crop area. Has the profitability of RM crop affected because of the introduction of national rural employment scheme? The results presented in Table 7 pertaining to HAHP state shows no symptom of any reduction of profitability due to the implementation of employment scheme. Although the growth rate in cost of human labour incurred for the cultivation of RM crop has increased at a rate of 5.44 percent/annum during post-MGNREGS period as compared to the negative growth of -7.04 percent/annum during pre-MGNREGS period, the average cost of human labour is found to be almost the same for both periods. The average cost of machine labour too has not increased during post-MGNRGES period, but there is a sharp drop in the bullock labour cost, which is surprising result. Because of minor changes that have taken place in the operation-wise cost, the gross cost of cultivation (C2) has also not changed substantially after the introduction of employment scheme. With no appreciable increase in productivity, the profitability of RM crop in HAHP state has increased only marginally during post-MGNREGS period; from Rs. 2397/ha to Rs. 2569/ha.

Table 7: Cost and profitability of rapeseed & mustard cultivation from 2000-01 to 2010-11 (values in Rs. are at 1986-87 prices)

Costs/Profit	Particulars	Rajasthan(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)	893	889	891	653	691	671
	CGR (%)	-7.04	5.44	-1.12	4.55	2.29	3.59
	Share (%)	22.44	22.08	22.27	16.54	17.61	17.02
Bullock Labour	Cost(Rs)	68	32	52	116	84	101
	CGR (%)	2.17	-25.40	-14.74	21.78	-12.74	6.05
	Share (%)	1.71	0.81	1.30	2.92	2.14	2.57
Machine	Cost(Rs)	534	543	538	522	509	516
Labour	CGR (%)	1.98	-2.71	-0.55	-1.66	0.11	-0.62
	Share (%)	13.42	13.50	13.46	13.21	12.98	13.10
Yield	Cost(Rs)	815	773	796	774	595	692
Enhancing	CGR (%)	0.88	-9.85	-3.21	-2.33	-5.62	-5.62
Inputs	Share (%)	20.48	19.20	19.89	19.59	15.15	17.58
Other cost	Cost(Rs)	1669	1787	1723	1888	2046	1959
(fixed costs)	CGR (%)	2.04	-0.36	1.32	2.81	5.14	3.38
	Share (%)	41.95	44.42	43.08	47.77	52.12	49.74
Cost C2	Cost(Rs)	3979	4024	4000	3951	3925	3939
	CGR (%)	-0.35	-1.40	-0.51	1.43	1.39	1.14
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of Output	VOP(Rs)	6376	6593	6475	5459	5998	5704
	CGR (%)	2.42	-1.01	1.87	1.49	4.32	2.92
Yield (qtl/ha)		13.79	14.08	13.92	11.98	12.79	12.35
Profit (VOP-C2)		2397	2569	2475	1508	2073	1765
Number of years profit realized		6/6	5/5	11/11	6/6	5/5	11/11

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).

The structure of operation-wise cost and profitability of RM crop in HALP state are somewhat different from the one observed at HAHP state. The real cost of human labour has increased only marginally during post-NREGS period, but its growth rate has decelerated (from 4.55 to 2.29 percent) considerably after the introduction of employment scheme which is not observed at HAHP state. Despite a deceleration in human and bullock labour cost, no appreciable increase has been noted on the machine labour cost which is a perplexing result. As observed in HAHP state, these changes have not made any big impact on the gross cost of cultivation. Because of marginal increase in productivity and no big change in cost C2, the profitability of RM crop in HALP state has increased from Rs. 1508/ha to Rs. 2073/ha after the introduction of NREGS. It appears on the whole that the profitability of RM crop in both high and low productivity states have increased after the introduction of national rural employment programme (see, Figure 6).

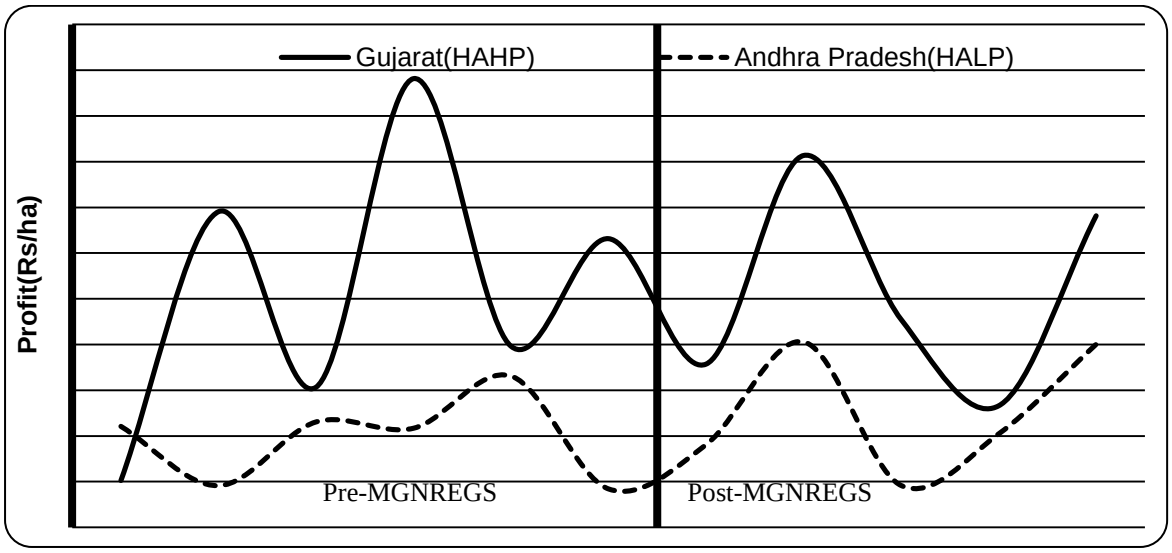


Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Rs. 12.77
Source: Author's Estimation

Figure 6: Profitability in rapeseed & mustard cultivation at 1986-87 prices

3.7. Profitability in Groundnut

Groundnut is an important traditional oilseed crop cultivated in most part of India, but with less coverage of irrigation. With 6.46 mha in 1960-61, its area peaked to a level of 8.71 mha during 1989-90, but thereafter its area has been coming down continuously to a level of only 5.26 mha in 2012-13. Increased cost of cultivation, repeated crop failures, low market price, poor remuneration from its cultivation, etc., are often cited as the main reason for the decline in its area under cultivation. Whatever may be the reasons for the decline of area in the past, let us now study the scenario of groundnut cultivation after the implementation of NREGS. As followed for other crops, we have selected Gujarat as HAHP state and Andhra Pradesh as HALP in order to study the profitability of groundnut.



Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Indian Rs. 12.77
Source: Author's Estimation

Figure 7: Profitability in groundnut cultivation at 1986-87 prices

Table 8 presents the operation-wise cost, gross cost of cultivation, value of output and profit in relation to cost C2 for both the states selected for the analysis. As expected, the cost and income pattern of groundnut cultivation in the selected two states is distinctly different, which is clearly evident from the results presented in the table. In the case of HAHP state, although the human labor cost in real value is same for pre and post-NREGS period, its growth rate is relatively higher during post-NREGS period, which is also noticed in most crops we have analyzed so far. Given the marginal increase in human labor cost, a big increase was expected in the machine labor cost during post-NREGS period, but it did not happen as per the data of CACP. Mainly because of increase in cost of yield increasing inputs, the gross cost of cultivation has increased by about Rs. 737/ha after the introduction of NREGS over its previous period. This increase has made some impact on the profitability of groundnut in HAHP state, which has declined from Rs. 592/ha to Rs. 573/ha after the introduction of NREGS. Besides decline in absolute profitability, the number of years profit realized by the farmers in HAHP state has also declined after the introduction of employment scheme.

Table 8: Cost and profitability of groundnut cultivation from 2000-01 to 2010-11. (values in Rs. are at 1986-87 prices)

Costs/Profit	Particulars	Gujarat(HAHP)			Andhra 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 Labor	Cost(Rs)	1239	1292	1263	1307	2271	1745
	CGR (%)	2.50	3.52	1.59	2.48	16.45	7.72
	Share (%)	24.22	22.06	23.17	26.15	32.17	29.40
Bullock Labor	Cost(Rs)	545	608	574	342	338	341
	CGR (%)	13.02	-0.13	5.46	12.47	-3.94	4.17
	Share (%)	10.65	10.38	10.52	6.85	4.79	5.74
Machine Labor	Cost(Rs)	337	432	380	166	248	203
	CGR (%)	10.69	0.52	5.61	5.92	18.11	7.11
	Share (%)	6.59	7.37	6.97	3.31	3.51	3.42
Yield	Cost(Rs)	1579	2019	1779	1492	1774	1620
Enhancing	CGR (%)	2.29	5.53	3.51	2.18	8.96	4.39
Inputs	Share (%)	30.86	34.48	32.63	29.85	25.12	27.29
Other Cost	Cost(Rs)	1417	1505	1457	1691	2429	2027
(fixed costs)	CGR (%)	11.02	8.42	6.31	1.43	13.05	6.74
	Share (%)	27.68	25.71	26.72	33.83	34.41	34.15
Cost C2	Cost(Rs)	5118	5855	5453	4998	7060	5936
	CGR (%)	6.06	4.79	4.01	2.78	12.08	6.31
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of Output	VOP(Rs)	5709	6428	6036	3978	6344	5053
	CGR (%)	18.59	10.31	10.75	0.71	17.43	8.34
Yield (qtl/ha)		11.76	11.90	11.82	9.15	13.37	11.07
Profit (VOP-C2)		591	573	583	-1021	-717	-883
Number of years profit realized		4/6	3/5	7/11	0/6	2/5	2/11

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).

The economics of groundnut cultivation in HALP state appears to be more dreadful as compared to its counterpart HAHP state. Except bullock labor cost, the costs of all other operations have increased considerably after the introduction of NREGS. Among all operations, the cost of human labor has increased substantially from Rs. 1307/ha to Rs. 2271/ha and its growth rate has registered at 16.45 percent/annum during NREGS period. Although the increased human labor cost is expected to reduce the cost of machine labor (as these two are substitutes), this has not happened in HALP state. The cost of machine labor grew at a rate of 18.11 percent/annum during NREGS, which is unprecedented. Because of the increased cost in most operations, the gross cost of cultivation in HALP state has also increased from Rs. 4998/ha to Rs. 7060/ha between the two periods of analysis. Despite realization of substantial increase in value of output, the increased cost of cultivation has not helped the farmers to realize any profit from groundnut cultivation in HALP state during NREGS period. What appears is that if the human labor has not increased substantially after the introduction of NREGS, the groundnut would have been profitable to

farmers. One good thing happened for groundnut growers during NREGS period is that they were able to realize profit at least two out of five years, which was not the case during pre-NREGS period. On this ground, one can say that despite substantial increase in human labor cost, the farmers cultivating groundnut in HALP state are less affected during NREGS period (see, Figure, 7).

3.8. Profitability in Sugarcane

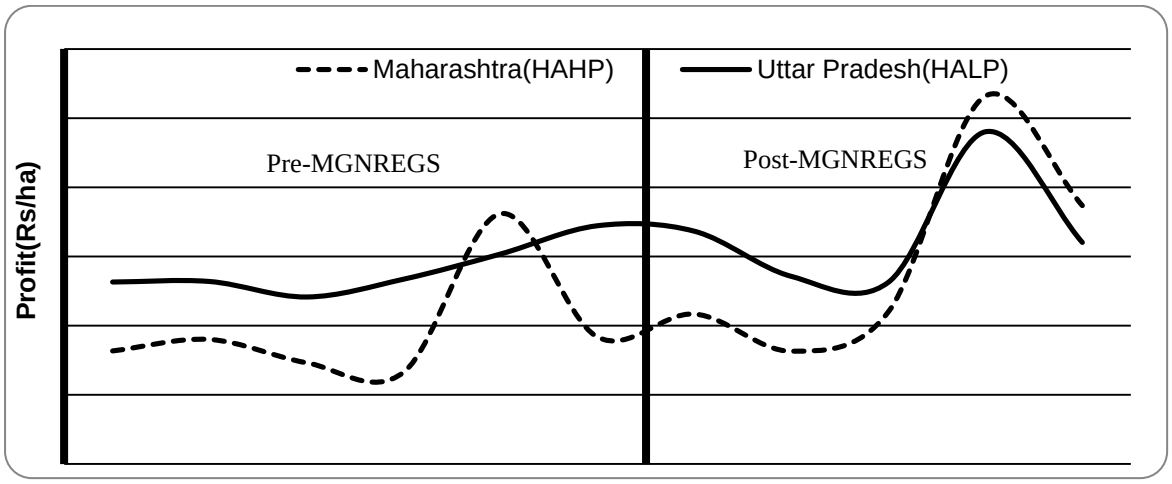
It is well known fact that the farm profitability varies from one crop to another depending upon the nature of the crop. Therefore, what is seen above from cereals, pulses and oilseeds may not be the same with high value crops. Keeping this in view, we have selected two important high value commercial crops namely sugarcane and cotton for studying its profitability. As the pattern of cultivation of these two crops is totally different, let us first study sugarcane crop. Sugarcane is a water-intensive crop mostly cultivated in the assured irrigated region. With assured prices and marketing facility from sugar industries, farmers cultivating sugarcane are able to get assured income and therefore, its area has been consistently increasing over the years; from 2.42 mha in 1960-61 to 5.06 mha in 2012-13. Considering area and productivity, we have selected two states namely Maharashtra as HAHP state and Uttar Pradesh as HALP state for studying the profitability of sugarcane crop. It is appropriate to mention here that these two states together accounted for about 63 percent of India's total sugarcane area in 2012-13.

Table 9: Cost and profitability of sugarcane cultivation from 2000-01 to 2010-11. (Values in Rs. are at 1986-87 prices)

Costs/Profit	Particulars	Maharashtra(HAHP)			Uttar 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 Labor	Cost(Rs)	5164	5296	5224	2727	2872	2793
	CGR (%)	4.65	3.72	3.33	1.28	2.14	0.95
	Share (%)	26.18	25.37	25.80	26.97	26.74	26.86
Bullock Labor	Cost(Rs)	645	799	715	143	234	184
	CGR (%)	21.02	-8.58	6.27	-2.30	18.93	10.19
	Share (%)	3.27	3.83	3.53	1.41	2.18	1.77
Machine Labor	Cost(Rs)	1928	1606	1782	257	239	249
	CGR (%)	3.92	5.53	2.29	3.82	-4.05	-0.52
	Share (%)	9.77	7.69	8.80	2.54	2.23	2.39
Yield Enhancing	Cost(Rs)	6636	6217	6446	2411	2365	2390
Inputs	CGR (%)	10.61	-0.29	1.97	3.12	2.76	2.18
	Share (%)	33.64	29.78	31.83	23.85	22.02	22.99
Other Cost	Cost(Rs)	5249	6958	6026	4574	5029	4781
(fixed costs)	CGR (%)	4.62	6.53	4.95	6.19	0.62	2.77
	Share (%)	26.60	33.33	29.76	45.24	46.83	45.99
Cost C2	Cost(Rs)	19728	20876	20250	10112	10739	10397
	CGR (%)	7.16	2.96	3.40	3.91	1.79	2.20
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Value of Output	VOP(Rs)	19462	25930	22402	14141	17448	15645
	CGR (%)	8.74	8.90	7.66	7.22	0.22	3.31
Yield (qtl./ha)		821.92	897.20	856.13	497.76	512.24	504.34
Profit (VOP-C2)		-266	5054	2152	4029	6709	5247
Number of years profit realized		1/6	4/5	5/11	6/6	5/5	11/11

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).

The results presented in Table 9 shows that costs of various operations including the human labor incurred for cultivating sugarcane in HAHP state have not increased appreciably after the introduction of NREGS. While the human labor cost increased only by about Rs. 132/ha, the machine labor cost has declined by about Rs. 322/ha during NREGS as compared to its previous period. Due to minor changes in operation-wise cost of cultivation, the gross cost of cultivation in absolute term has increased by about Rs. 1148/ha between the two periods. This increase however has not made any negative impact on the profitability of sugarcane in HAHP state, where it increased to Rs. 5054/ha during NREGS period from a loss of Rs. 266/ha during pre-NREGS period. Not only the average profit from sugarcane cultivation has increased but the number of years profit was realized by the farmers also increased from one out of six years to four out of five years after the initiation of rural employment scheme.



Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Indian Rs. 12.77
Source: Author's Estimation

Figure 8: Profitability in sugarcane cultivation at 1986-87 prices

The pattern of profitability of sugarcane cultivation in HALP state is somewhat different from that of HAHP state. The costs of both human and bullock labor have increased marginally, while the costs on machine labor and yield increasing inputs have declined marginally after the introduction of NREGS. The gross cost of cultivation has also increased only by Rs. 627/ha between the two periods because of small changes in the operation-wise cost of cultivation. Despite having much lower productivity of sugarcane as compared to HAHP state, the profitability of sugarcane is relatively higher in HALP state mainly because of lower cost of cultivation. The profitability has increased from Rs. 4029/ha in pre-NREGS period to Rs. 6709/ha after its introduction in HALP state, which is totally different from HAHP state (see, Figure 8). Farmers cultivating sugarcane in HALP state have also not incurred losses in any of the years from 2000-01 to 2010-11 considered for the analysis which is also different from HAHP state. On the whole, the analysis seems to suggest that the profitability of sugarcane in both the states have not declined after the introduction of MGNREGS.

3.9. Profitability in Cotton

Cotton is an important commercial crop which has been traditionally cultivated in various parts of India. Its area was hovering around 7-8 mha till the year 2003-04, but it increased to 12.18 mha in 2012-13 possibly because of the Bt cotton revolution. Though it is a high value commercial crop, it is predominantly cultivated under rainfed condition; the irrigation coverage has increased only from 12.70 percent in 1960-61 to 33.80 percent in 2010-11 at all India level. In order to study the profitability of cotton crop, we have selected Gujarat as HAHP state and Maharashtra as HALP state. Although the irrigation coverage under this crop in Gujarat (28.70 percent) and Maharashtra (2.70 percent) is totally different, these two states together accounted for about 56 of India's total cotton area in 2012-13. Therefore, the analysis of these two states is expected to be useful in understanding the profitability of cotton cultivation before and after the introduction of NREGS.

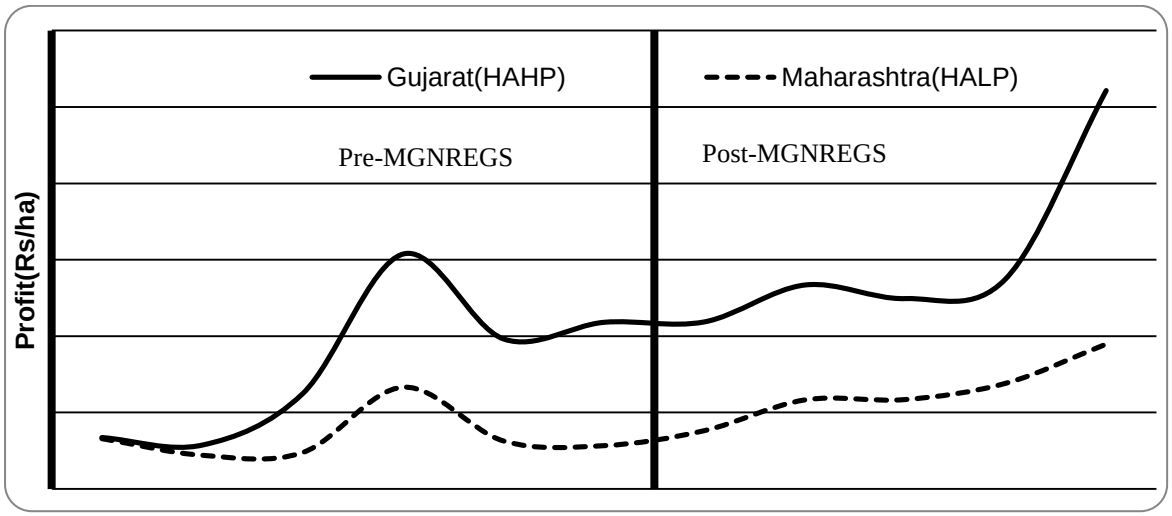
As followed earlier, the profitability of cotton cultivation in HAHP state (Gujarat) is first taken for analysis. As can be seen from Table 10, the cost of human labor has increased by about Rs. 587/ha after the introduction rural employment scheme over its previous period, which is expected. The cost of machine labor which has direct relationship with the cost of human

labor has marginally declined by about Rs. 18/ha over its previous period. As a result of increased cost in various operations including the fixed costs, the gross cost of cultivation has increased substantially by about Rs. 2194/ha over pre-NREGS period. This substantial increase in gross cost of cultivation has not affected the profitability of cotton in HAHP state because of significant increase in its productivity which increased from 11.38 qtl/ha to 22.51 qtl/ha during the period selected for the analysis. The profitability of cotton computed in relation to cost C2 has also increased from Rs. 1238/ha to Rs. 4125/ha during post-NREGS period. It appears from the analysis that the profitability in cotton cultivation in HAHP state has increased after the introduction of NREGS. Moreover, farmers of HAHP state have realized profit in all the years during post-NREGS period (see, Figure 9).

Table 10: Cost and profitability of cotton cultivation from 2000-01 to 2010-11 (Values in Rs. are at 1986-87 prices)

Costs/Profit	Particulars	Gujarat(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)	1935	2522	2202	1384	1981	1655
	CGR (%)	16.22	6.48	9.30	-0.38	18.71	8.44
	Share (%)	31.62	30.34	30.94	23.54	28.03	25.79
Bullock Labour	Cost(Rs)	363	418	388	1311	1302	1307
	CGR (%)	9.94	4.09	5.49	15.91	-5.41	5.25
	Share (%)	5.94	5.03	5.45	22.31	18.43	20.37
Machine Labour	Cost(Rs)	428	410	420	198	209	203
	CGR (%)	5.23	-5.36	-0.65	-1.54	14.85	5.82
	Share (%)	7.00	4.93	5.90	3.36	2.95	3.16
Yield Enhancing Inputs	Cost(Rs)	1719	2246	1959	1420	1602	1503
	CGR (%)	16.57	0.12	6.73	1.11	8.91	3.76
	Share (%)	28.10	27.02	27.53	24.16	22.67	23.41
Other Cost (fixed costs)	Cost(Rs)	1647	2639	2098	1565	1973	1750
	CGR (%)	22.11	10.67	14.90	3.32	13.61	7.30
	Share (%)	26.91	31.74	29.48	26.62	27.92	27.27
Cost C2	Cost(Rs)	6119	8313	7117	5877	7067	6418
	CGR (%)	16.81	6.29	9.70	3.96	10.33	6.49
	Share (%)	100.00	100.00	100.00	100.00	100.00	100.00
Cost C3	Cost(Rs)	6731	9106	7810	6465	6957	6689
Value of Output	VOP(Rs)	7357	12439	9667	5244	7618	6323
	CGR (%)	25.74	13.74	18.32	3.94	16.28	9.78
Yield (qtl/ha)		11.38	22.51	16.44	8.49	12.47	10.30
Profit (VOP-C2)		1238	4125	2550	-633	551	-95
Number of years profit realized		4/6	5/5	9/11	1/6	4/5	5/11

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).



Footnote: Average Annual Exchange Rate in 1986-87 is: 1 USD = Indian Rs. 12.77
Source: Author's Estimation

Figure 9: Profitability in cotton cultivation at 1986-87 prices

Is the profitability of cotton in HALP state different from that of HAHP state? The results presented in Table 10 show that there is a vast difference in profitability of cotton between the two selected states. Although the average cost of human labor has increased more or less on the same pattern which is noted in HAHP state, the level of profit realized by the farmers belonging to HALP state is abysmally low. It appears that this low profit is not mainly due to fast increase in human labor cost but mainly because of low productivity. Between pre and post-NREGS period, the productivity increased by about 11.31 qtl/ha in HAHP state, whereas the same increased only by about 3.98 qtl/ha in HALP state. As a result of low productivity, the realization of profit was only Rs. 551/ha in HALP state during post-NREGS period as against the profit Rs. 4125/ha realized by the farmers belonging to HAHP state. One positive aspect about HALP state is that the farmers were able to reap some amount of profit after the introduction of NREGS, which was not there before the introduction of employment scheme. In addition to this, the number of years profit realized by the farmers have also increased dramatically after the introduction of NREGS; four out of five years as against one out of six years during pre-NREGS period. The analysis suggests that the profit from cotton cultivation appears to have improved in both HAHP and HALP states after the introduction of NREGS.

4. Conclusions and Suggestions

It is argued in different quarters, including farmers organization that the introduction of MGNREGA (national rural employment scheme) in rural areas has increased the farm wage rate substantially that resulted in sharp reduction in farm profitability. Is there any substance in this argument? Although a large number of studies have analyzed the impact of NRGES on wage rate and other parameters utilizing both the primary and secondary information in different states, detailed studies are not available focusing specifically on the profitability in different crops cultivation covering various states. In this study an attempt is made to fill this gap utilizing cost of cultivation survey data available for different crops published by the CACP. It has considered data from 2000-01 to 2010-11 and has covered nine different crops namely paddy, wheat, sorghum, chick pea, pigeon pea, rapeseed and mustard, groundnut, sugarcane and cotton for the analysis of profitability. As the productivity of crop often determines the profitability, two states for each crop [one each from the category of high area with high productivity and high area with low productivity] have been considered for the analysis.

The results of the study have shown mixed results, but 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 labor has increased considerably in eight out of nine 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 calculated by deducting the value of output from cost C2 has increased in eight out of nine crops in HAHP states, whereas either the profitability has increased or the losses reduced in HALP states in all nine crops. Not only the average profit of most crops has increased but the number of years profit realized by the farmers has also increased in most crops during the post-NREGS period as compared to pre-NREGS period (2000-01 to 2005-06). While there is no distinct pattern emerging in profitability between food grain and non-food grain crops, the level of increase in profitability is found to be relatively better among the non-food grain crops after the introduction of NRGES. Increased productivity in most crops considered for the analysis has one way or the other helped to negate the increase in human labor cost which also facilitated to increase profitability.

Although there is no clear evidence from this study to show that the profitability of crops has declined during post-NREGS period, this may not be true in all regions/states in India. Regions where the employment scheme has 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-NREGS period, the profitability has not been affected despite considerable increase in human labor cost. Therefore, concerted efforts need to be introduced to increase the productivity of crops to increase the gross value of the crops and to negate the cost increase in human labor.

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-NREGS period, if the cost of human labor had not increased appreciably. The relatively less increase in 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 (GOI, 2006) has suggested that the government should announce the minimum support price (MSP) for crops at 50 per cent 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 labor incurred for cultivating different crops (paddy, sorghum, pigeon pea and groundnut) 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 NREGS. This has either reduced the profitability of the crop or created losses for farmers in relation to cost C2. One needs to find out as to why has this happed specifically in south Indian states? Is it due to labor 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 labor in peak season of agricultural operation on account of NREGS” as one of the reasons for the distress call made by the farmers. Our analysis based on cost of cultivation survey data also seems to indicate that the labor scarcity accentuated due to NREGS may have increased the cost of human labor at a faster rate. Therefore, arrangements may be made to link up NREGS with agricultural operations to reduce the labor scarcity and also to improve the profitability in crops cultivation.

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