Journal of Agricultural Development and Policy, 2024
Volume 34, No. 1, 111-116
https://doi.org/10.63066/23220457.34.1.014

NAAS - 4.34
UGC CARE List Journal

Post-Covid Labour Shortage, Wages and Mitigation Strategies in Punjab Agriculture

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Abstract

By using the data from 47 villages in 12 districts of Punjab, the present study examines the effect of lockdown-induced labour shortage on wages and farmers' mitigation strategies in agriculture. The labour shortage owing to the return of migrant workers, though not fully, but was largely compensated by the local workers unemployed from other sectors. On an average, the wages increased by more than 50 per cent over the previous year. The wages increased as compared to the previous year as the shortage of migrant workers due to mobility. While the area under paddy affected the wages positively, the total number of agricultural workers had a negative influence. Farmers used three major mitigation strategies and reduced area under paddy by 2.6 per cent, adopted direct seeding of rice on 10 per cent area and practised mechanical transplantation of paddy on 1.5 per cent of area but none of these strategies could have a statistically significant check on wage increase.

Keywords: Agricultural Labour, COVID-19, Labour Shortage, Migrant Workers, Mitigation Strategies in Agriculture

JEL Classification: O13, M54, F59, F22

Introduction

On March 24, 2020, India enforced a lockdown to curtail the spread of coronavirus disease i.e. popularly known as Covid-19. The lockdown remained in force till May 31, 2020. Though agricultural activities were not in the ambit of the lockdown, yet rural labour markets were adversely affected. Due to fear of life and livelihood, the migrant workers returned to their native states, creating labour shortages in the farm and non-farm sectors (Srivastava, 2020; Dev and Sengupta, 2020; Cretan and Light, 2020; Guido *et al*. 2020). Punjab agriculture heavily depends on migrant workers for its labour requirement. The number of migrant agricultural workers (mainly from Bihar and eastern Uttar Pradesh) in Punjab increased from 11.32 lakh in 1981 to 14.74 lakh in 2011 (Singh and Bhogal, 2014).

As the migrant workers returned to their native states, Punjab faced an acute labour shortage. The imposition of the lockdown coincided with the beginning of the wheat harvest. Since wheat harvesting and threshing are primarily mechanized, the return of migrants did not have much effect. Nevertheless, it was expected to significantly impact the agricultural operations in the next crop season, especially on paddy transplantation, primarily being done manually. Punjab requires around 500 million man-days of wage work to transplant paddy on around 3 million hectares. The tightening of the labour market started pushing the wage rates up. This was expected to influence farm profits, farmers' choice of techniques and also of crops.

This study attempts to understand the impact of lockdown-induced labour shortage on paddy transplantation, wage rates and farmers' strategies to adapt to changing labour market dynamics in Punjab. It specifically looks into three issues: (i) the effect of out-migration on labour availability for paddy transplantation and wage rates, (ii) the transition in the workforce from non-farm to farm sector, and (iii) strategies adopted by farmers to mitigate labour shortages.

Data Sources and Methodology

The evidence presented in this study conducted from July to November 2020, was based on a village-level survey undertaken in 47 villages of 12 districts of Punjab of Amritsar, Bathinda, Fatehgarh Sahib, Ferozepur, Hoshiarpur, Ludhiana, Moga, Pathankot, Rupnagar, Sangrur, SAS Nagar and Sri Muktsar Sahib. The districts and villages are representative of the three agro-climatic zones of Punjab viz., sub-mountainous zone, central plain zone and south-western zone. The survey sought information through focused group discussions and key informants on several aspects of the village economy, including the status of migrant workers, wages, farming households, local workers, unemployment status, and

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Table 1. Distribution of villages based on various size parameters

Population	No. of Villages	No. of Households	No. of Villages	Cultivated area (acres)	No. of Villages
Below 1200	14	Below 100	14	Below 500	13
1200-2500	18	100-250	18	500-1300	19
2500 or above	15	250 or above	15	1300 or above	15
Total	47	Total	47	Total	47

landholdings; and choice of crops and techniques in response to labour crisis due to the exodus of migrant workers from the local labour markets. The villages differ considerably in their size of population and cultivated land (Table 1).

The multiple linear regression model has been used to estimate the determinants of wage hike in Punjab. The variables such as wages (2019), cultivated area, percentage of farm house holds, area under paddy, reduction in area under paddy, number of migrant workers, local workers, wage workers, area under DSR and mechanical transplanting has been used as independent variable in the study.

Results and Discussion

Paddy (including basmati) occupied three-fourths of the kharif area in 2020, followed by fodder (11.3%), and cotton (6.8%). Maize, cotton, sugarcane and vegetables each occupied 2-3 per cent of the kharif-cropped area. The minimum and maximum proportion of cropped area show wide variability in the cropping pattern across villages.

Details of wage workers (farm, non-farm and migrants) are presented in Table 3. There was a considerable change in the number of rural wage workers due to the Covid-19 situation.

The number of migrant workers reduced by more than half as compared to 2019. The number of local wage workers increased by around nine per cent as some marginal and small farm families were also forced to enter agricultural wage markets. The COVID-19 pandemic caused a significant setback to non-farm wage workers as more than 43 per cent lost their work and were rendered unemployed. The unemployed local wage workers sought work in agriculture during paddy transplantation and compensated mainly for the reduction in migrant workers due to the return to their native states.

Labour Shortages, Wage Rise and Mitigation Strategies

Due to the COVID-19 pandemic, the number of wage workers in agriculture and other sectors changed considerably in Punjab. In more than 70 per cent of villages, as many migrant workers returned to their native states, their number declined substantially during 2020. Still, many local wage workers were laid off due to the shutting down of the non-farm sector, including industry and service sectors. Despite this, the net availability of wage workers for paddy transplantation during 2020 could not reach the past levels in most villages, ultimately leading to a more than 50 per cent increase in wages for paddy transplantation from Rs 2979/acre to Rs 4391/acre. A much higher increase in wages was expected, which might have been checked due to multiple mitigation strategies adopted by farmers for the labour shortage. The farmers chose to reduce the area under paddy and shift to other crops (72 per cent villages) and adopted direct seeding of rice (98 per cent villages). Almost 10 per cent of the kharif

Table 2. Cropping pattern in the study area

Crops	% of Kharif season area	Minimum area (%)	Maximum area (%)
Paddy	67.5	19.0	87.9
Basmati	6.8	0.1	29.8
Maize	2.1	-	27.3
Cotton	6.8	-	49.0
Sugarcane	2.9	-	60.0
Vegetables	1.8	-	18.6
Fodder	11.3	2.8	30.1
Others	0.8	-	20.6
Average area cultivated (acre/village)	1152	NA	NA

Table 3: Average number of wage workers in the study villages

Wage workers	2019	2020
Migrants	146	69 (-52.7)
Local (farm)	99	108 (+9.1)
Local (non-farm)	109	62 (-43.1)
Local (unemployed)	4	62 (+1450.0)
Local (total)	212	232 (+9.4)
Total agri-wage workers (local + migrant)	249	239 (-4.0)

Note: Figures in parenthesis indicates percentage change

area was brought under DSR, though the reduction in paddy area was only 2.6 per cent. Mechanical transplantation of paddy was also practised in about 21 per cent of villages but covered only around 1.5 per cent area.

Wage Increase and Its Determinants

The wages for paddy transplantation increased across all the villages, but the increase was not uniform and varied from Rs 300/acre to Rs 3700/acre. While some villages experienced only a 10-20% increase in wages over the previous year, they more than doubled in many others. We classified the villages into low, medium and high-wage increase villages for more insight into the wage increase and its factors. The villages with a wage increase of up to Rs 1000/acre, between Rs 1000-2000/acre and above Rs 2000/acre were classified as low, medium and high category villages, and their numbers were 18, 15 and 14, respectively.

A descriptive analysis of wage increase and its factors is presented in Table 5. The wages for paddy transplantation rose by Rs 650/acre in low, Rs 1420/acre in medium and Rs 2721/acre in high-wage-increase villages. The wage hike was unequal across different villages from as low as one-fourth to as high as double the wages during 2019, and the increase was more in the villages with lower wages during 2019. The village population, total number of households, number of farm households and the total cultivated land in the village bore a negative relationship with the wage increase. There was no trend in reduction in paddy area across low, medium and high wage increase villages.

Contrary to the expectations, the reduction in the number of migrant workers was higher in those villages which witnessed lower wage hikes and lower in the villages with the higher wage increase. Due to the Covid-19 pandemic and shutting down of economic activities in the country, including Punjab, almost 43% of the non-farm wage workers were rendered unemployed, exploring possibilities of employment in agriculture during the crisis. As migrant worker returned to their home due to no job availability and mobility restrictions (Sengupta and Jha 2020; Dilnashin *et al* 2021). The villages witnessing more unemployment of local workers saw a relatively lower wage increase than the villages with lower unemployment. Also, the villages with lower wage increases brought more area under DSR and mechanically transplanted rice than villages with higher wage increase.

A simple regression analysis was undertaken to assess the statistical significance of various factors for wage increases for paddy transplantation. The results of the three regression equations are presented in Table 6. All relevant variables were included in the first equation, but the reduction in migrant workers and number of unemployed non-farm workers were removed from the other two equations as they appeared non-significant. The number of agricultural wage workers (migrants, agricultural wage workers and unemployed non-farm workers seeking employment in agriculture) or change in their number are likely to be more relevant explanatory variables for wage increase during the Covid-19 period. The regression estimates indicate that the wages of the previous year (2019), the proportion of farm households, and the total number of farm wage workers significantly influenced the wages during paddy transplantation. Though weak, but the area under paddy also affected the wages. Contrary to the expectations, the size of the village (represented by cultivated area), reduction in area under paddy, reduction in the flow of migrant workers, the extent of unemployed workers, and attempts to expand the area under DSR or mechanical transplantation of paddy had no significant influence on the wage hike. As increased unemployment amongst local wage workers nearly compensated for the reduction in migrant workers, any change in the total number of farm wage workers from 2019 to 2020 (as it was minimal) did not affect the wages.

Table 4: Labour shortage, wages and mitigation strategies in the villages

Particulars	No. of villages (in %age)
Labour shortage	
Reduction in migrant wage workers	70.2
Increase in farm wage workers	10.6
Increase in unemployed wage workers from the non-farm sector	76.6
Increase in total wage workers available for paddy transplantation	6.4
Wages for paddy transplantation	
Wages during 2019 (Rs/acre)	2979
Wages during 2020 (Rs/acre)	4391
Increase in wages (Rs/acre) (%increase over 2019 in parentheses)	1512 (52.5)*
Mitigation strategies	
Decline in area under paddy (including basmati)	72.3 (-2.6)
Increase in area under maize	27.7 (+0.3)
Increase in area under cotton	6.4 (0.2)
Increase in area under sugarcane	21.3 (0.6)
Increase in area under other crops	19.1 (1.7)
Adoption of direct seeding of rice	97.9 (10.0)
Adoption of mechanized transplantation of paddy	21.3 (1.5)

Note: Figures in parentheses are %age of total area under paddy (including basmati).
** Wages show a 52.5% increase over the previous year of 2019*

Table 5. Wages for paddy transplantation and important factors

Particulars	Low (n=18)	Medium (n=15)	High (n=14)
Wage during 2019	3066	2847	2671
Wage during 2020	3766	4267	5392
Wage increase	650	1420	2721
Village population	2964	1925	1767
Number of households	548	353	305
Number of farm households	344	142	134
Operational area (acre)	1612	918	817
Reduction in area under paddy (including basmati) (acres)	41	6	41
Reduction in number of migrant workers	113	70	40
Increase in number of local wage workers (farm)	20	-	4
Increase in unemployed wage workers (non-farm)	102	44	22
Area under DSR (acres)	192	75	60
Area with mechanical transplantation of paddy	29	11	7

Table 6: Regression estimates of determinants of wage hike in Punjab (Dependent variable: Wage increase over 2019)

Variables	Model-I	Model-II	Model-III
Constant	4937.82	4685.40	4476.27
	(0.000)	(0.000)	(0.000)
Wage-2019 (Rs/acre)	-0.77	-0.71	-0.68
	(0.012)	(0.015)	(0.025)
Cultivated area in the village (acre)	-0.39	-0.73	-0.71
	(0.495)	(0.111)	(0.154)
%age of farm households	-16.65	-15.71	-15.82
	(0.029)	(0.030)	(0.037)
Area under paddy (including basmati) in 2019 (acre)	0.70	0.97	0.90
	(0.274)	(0.093)	(0.146)
Reduction in area under paddy (including basmati) over 2019 (acre)	1.41	2.69	2.17
	(0.606)	(0.235)	(0.366)
Reduction in number of migrant workers (No.)	-1.99	-	-
	(0.274)		
Increase in unemployed local workers (non-farm) (No.)	1.34	-	-
	(0.642)		
Total number of wage workers in (including migrants) (No.)	-2.00	-1.89	-
	(0.073)	(0.062)	
Change in total number of wage workers (including migrants) (No.)	0.34	-	-0.68
	(0.947)		(0.889)
Area under DSR (acre)	-0.57	-0.02	-1.89
	(0.72)	(0.988)	(0.140)
Area with mechanical transplantation of paddy (acre)	2.07	1.37	-1.51
	(0.544)	(0.615)	(0.526)
Adjusted R-Square	0.317	0.347	0.284

Note: Figures in parentheses are p-values

Conclusion and Policy Implications

There were considerable variations in wage increases during paddy transplantation in Punjab during 2020. Many factors played for the rise; some factors played a significant role, while others were unable to contain/influence wages. The villages with relatively higher wages before the COVID-19 period (2019) witnessed a lower wage increase. The negative and significant coefficient of the percentage of farm households in the villages indicates that villages with a higher proportion of farm households witnessed a smaller increase in wages. Interestingly, their larger proportion increased their bargaining power to hire local wage workers and settle for a lesser wage. There were some reports of efforts by the farmers to decide collectively against paying much higher wages during 2020. More area under paddy translated into higher demand for wage workers and hence contributed significantly to the wage. On the supply side, the exodus of migrant workers to their native states or unemployment of local wage workers could not influence the wages as both these phenomena coincided and balanced their upward/downward influence on wages. The total number of wage workers in agriculture (comprising migrants, local farm workers and local unemployed) influenced the wages. The villages with relatively higher supply witnessed smaller wage hikes. There was no major change in the overall supply of wage workers in agriculture during the COVID-19 period, and it did not influence wages. Another vital strategy for the farmers to enhance the supply of labour in the villages was arranging and paying for the transportation of migrant workers to Punjab during the COVID-19 period. Those villages which resorted to such efforts on some significant scale witnessed relatively lower wage increases than other villages.

The farmers opted for multiple mitigation strategies to overcome labour shortages and check wage increases. Such methods included a reduction in area under paddy, adoption of DSR and mechanical transplantation of paddy. However, none of these strategies could contain the wage increase significantly. As already mentioned, the area under paddy declined marginally by 2.6%, and mechanical transplantation

was practised only on 1.5% area. Even the DSR, which was adopted over about 10% area, could not check the wage increase significantly. These results pointed out that such interventions will have to be expanded to much higher levels than the current 10-12% area, if the wage hike is to be contained significantly.

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Received: February 29, 2024 Accepted: June 08, 2024