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Dynamics of Human Labour Employment at Farm Households in Punjab

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Abstract

The present study was undertaken to examine the overtime changes in human labour employment at farm household in Punjab. To achieve the objective, farm level data at two points of time viz. 2004-05 and 2018-19 collected under 'Comprehensive Scheme for Studying the Cost of Principle Crops in Punjab' were analyzed. It was observed that in Punjab, the human labour use, on an average, farm household decreased by about 35 percent over the study period from 5798 man hours during 2004-05 to 3749 man hours for 2018-19. The respective decline in crop cultivation and livestock enterprise during this period was about 31 per cent 40 per cent respectively. The results of production function found that the size of operational holding, number of livestock, tractor use and Simpson's Index were having positive and significant effect on employment in Punjab households during both of the study years. The wage rate had negative and significant effect on human labour employment during both the study years. The study indicated that potential of agriculture sector for labour absorption in the state has been almost fully exploited.

Keywords: Employment, Agriculture, Human labour, Production function

JEL classification: J21, Q10, J43, C67

Introduction

There is a strong evidence to indicate that the technological parameters such as cultivated area, cropping intensity, higher use of inputs, etc. increased labour use while mechanisation and use of herbicides significantly reduced employment. The interplay of these factors resulted in net decline in the human labour requirements (Sidhu and Singh 2004). Since late 1990s, with the liberalisation of the economy, structure of Indian economy changed significantly. The rural economy also experienced these changes in terms of the rising real wages rates, increased rural-urban migration, labour shortage for agriculture sector, increased share of non-agriculture in both employment and income, increased non-farm incomes compared to farm incomes, rising input costs including labour cost and wider adoption of farm mechanisation.

There has been considerable reduction in human labour with almost complete exclusion of bullock labour in most of the crops and the use of machinery, fertilizers and insecticides has been increasing consistently (Sidhu *et al* 2011). In an economy with huge surplus of labour, the prime concern lies on the human labour employment. The impact of mechanization on labour came out to be negative at individual crop level in India. Small farmers devoted more labour per hectare on individual crops and there persisted the inverse relation between labour use and farm size. However, with the spread of new technology this relationship had a tendency to disappear. With the advent of new technology, the proportion of hired labour tended to increase and that of family labour declined and the proportion of female labour also plummeted. The seasonal fluctuations in agricultural employment were also reduced with the adoption of new technology (Basant 1987). The total employment effect even with respect to particular crops may be positive as long as the spread of labour-saving technology is associated with major changes in cropping pattern in favour of relatively labour intensive crops together with increase in gross cropped area (Bhalla 1987). In response to rising wage rates, there is increased farm mechanization and shift in the cropping pattern from labour intensive to labour saving crops (Reddy *et al* 2014).

The farm-mechanization along with seed-fertilizer technology proves to be complementary to the demand for labour in the initial phase of agricultural development. However, large scale introduction of harvesting combines and labour substituting inputs like weedicides and herbicides started competing with labour force leading to its displacement after mid-1980s onwards (Sidhu and Johl 2001, Devi 2011). The employment diversification declines and dependence on farming increases noticeably with increase in the landholding

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status of the workers and a majority of the households depend on multiple sources of income indicating the distress nature of employment activities in the rural areas of Punjab (Vatta *et al* 2008). It is under this background, the present study has been conducted to examine human labour use on farm households along with overtime changes. The important factors having bearing on employment of farm households have been identified through quantifying their impact in this regard.

Data Sources and Methodology

To achieve the objective, farm level data collected under 'Comprehensive Scheme for Studying the Cost of Principle Crops in Punjab' were analyzed. The comprehensive scheme for studying the cost of cultivation of principal crops in Punjab used three-stage stratified random sampling technique in sampling design. To uniformly represent whole region, the state was divided into three agro-climatic zones based on soil type, irrigation, rainfall, crops grown etc. Different stages of sampling include tehsils, clusters of villages and operation holding within a cluster of villages. The scheme covered 300 farm holdings distributed among 30 tehsils representing different agro-climatic zones.

In present study, in order to examine the regional effect, the agro-climatic zones were reframed according to the classification provided by National Remote Sensing Centre. The farm size holdings included small (<2 ha), medium (2-6 ha) and large (>6 ha) farm households. To examine the overtime changes in employment and income, cross-section data for two normal years i.e. latest available (2018-19) and the other with sufficient gap (2004-05) was analysed. After scrutiny some of the outlier/incomplete observations were omitted and the final sample considered in present study comprised of 295 and 294 farm households for the year 2004-05 and 2018-19, respectively. Labour hours were standardized through converting women and children labour into man-hours equivalents by using standard conversion factors of 0.67 and 0.50 respectively.

Determinants of Labour Use on Farm Households

Based on the value of coefficient of multiple determination (R^2) and sign and significance of the coefficients following Cobb-Douglas production function has been finalized to identify the determinants of labour employment on the farm households.

$$\ln Y_i = \ln\beta_o + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \ldots\ldots\ldots\beta_i \ln X_i + \ln u_i$$

(Where i = 1,2,3…..n)

The variables defined in the model are as follows

Y = Labour employment (Man hours/farm household), β_o = Constant, β_i = Estimated coefficient, u_i=Random error term, X1 = Age of farm household head (Years), X2 = Education of farm household head (Years of schooling), X3 = Operational area(Ha), X4 = Number of livestock, X5 = Variable cost (Rs/ha), X6= Income from other sources (Rs), X7 = Tractor use (Hours/ha), X8 = Combine use (Hours/ha), X9 = Wage rate(Rs/hour), X 10 = Proportion of family members involved in agriculture, X11 = Cropping intensity (%), X12 = Simpson's Index, D1 = Dummy variable for Zone I and D2 = Dummy variable for Zone III. The dummy variables were used to check the effect of agro-climate on labour employment for which zone II was taken as base.

The variables that may show positive effect on employment are operational holdings, number of livestock, tractor use, proportion of family members involved in agriculture, Simpson's index and cropping intensity as with the increase in these variables the labour employment will increase. While on the other hand with the use of combine harvester the labour employment will decrease and also with the increasing wage rate the labour employment will decline.

Results and Discussion

The human labour employment is an important aspect of various farming related enterprises. The components of human labour are broadly classified into family, permanently attached and casual labour. Various studies have reported that the human labour use in farming has been declined during the recent decades. The share of different components in total labour use is changing which also vary with the farm size categories. The present study inquires dynamics in labour employment on farm households through working out activity-wise, category-wise, component-wise employment of labour in overall, crop cultivation and livestock enterprise with reference years of 2004-05 and 2018-19.

The total human labour utilization among different activities comprising crop enterprise, livestock enterprise and other general farm activities during 2004-05 and 2018-19 has been portrayed in Table 1. It was noted that on average farm household in state, the total human labour employment in crop enterprise, livestock enterprise and other general farm activities per year was about 5798 man hours in 2004-05 which decreased to about 3749 man hours during 2018-19, thus, indicating a decline of about 35 per cent per year in a span of 14 years.

Farm activity-wise, the human labour use decreased from about 3124 man hours to 2147 man hours in crop cultivation, from 2137 man hours to 1281 man hours in livestock related activities and from 537 man hours to 320 man hours in other general farm activities. The respective over time decline in labour employment in these activities turns out to be 31.27, 40.04 and 40.36 per cent. During 2004-05 the proportionate share of human labour in crop enterprise was 53.87 per cent which increased to 57.27 per cent during 2018-19. The percent share of human labour in livestock enterprise decreased from 36.87 per cent in 2004-

Table 1. Activity-wise total human labour utilization on farm households, Punjab, 2004-05 and 2018-19

(Man hours/household)

Particulars	2004-05	2018-19	Change in 2018-19 over 2004-05	
			Absolute	Percentage
Crop enterprise	3123.55 (53.87)	2146.97 (57.27)	-976.58	-31.27
Livestock enterprise	2137.38 (36.87)	1281.49 (34.19)	-855.89	-40.04
Others general farm activities*	536.89 (9.26)	320.23 (8.54)	-216.67	-40.36
Total	5797.82 (100.00)	3748.69 (100.00)	-2049.14	-35.34

**Others include post harvest labour, machine upkeep labour, supervision and other general purpose labour, etc.*
Figures in parentheses are percentage to respective total

05 to 34.19 per cent in 2018-19. Similarly, in other general farm activities the human labour absorption was 9.26 per cent in 2004-05 which decreased to 8.54 in 2018-19. Thus, study points out that though the labour employment on farm households has been decreased overtime but the share of crop enterprise among all enterprises had increased over the study period.

Farm Size Category-wise and Component-wise Labour use

The component-wise human labour employment on the different size categories of farm households in Punjab is presented in Table 2. It has been observed that over a period of about one and half decade (2004-05 to 2018-19), on overall farms, the per farm use of family, attached and casual labour declined by 38.82 per cent (1334 man hours), 49.44 per cent (598 man hours) and 10.17 per cent (117 man hours). Increase in casualization of labour use on overall farm households has been indicated by the increased share of casual labour in total labour use from 19.86 per cent in 2004-05 to 27.59 per cent in 2018-19, whereas during this period the share of family as well as attached labour has decreased from 59.29 to 56.10 and from 20.85 to 16.30 per cent, respectively.

During 2004-05, the total labour employment on small, medium and large farm-size categories was 3560, 6270 and 9280 man hours per household per year respectively decreased to 2066, 3962 and 6550 man hours per household per year respectively during 2018-19. In percentage terms, the overtime decrease was the highest on small farms (41.95%) followed by medium farms (36.81%) and large farms (29.41%). The proportionate share of family labour in total human labour use revealed a strong negative relationship with the farm size as this component accounted for about 80 percent, 59 percent and 43 per cent of overall labour use during 2004-05 on small, medium and large size categories of farms respectively. In 2018-19, the share of family labour in total labour use on small holdings further increased to 83.53 per cent while share of family labour declined on medium and large categories to about 57 percent and 37 per cent respectively which pointed towards the strengthening of negative relationship of family labour use and farm size during the later period. Contrary to family labour, the proportionate use of attached labour and casual labour indicated a clear positive relationship with the farm size during both of the study periods. However, while the share of attached labour in total labour employment decreased across all the farm-size categories in the study period, the use of casual labour increased from 13.02 per cent to 15.16 per cent on small farms, 19.35 per cent to 27.49 per cent on medium farms and 25.70 per cent to 35.22 per cent on large farms.

Labour Utilization in Crop Cultivation

Human labour employment is one of the important resources used in crop cultivation. It has been observed that human labour use has shown declining trend overtime. This section discusses component-wise, crop-wise, operation-wise and gender-wise overtime changes in human labour use in crop cultivation during 2004-05 and 2018-19.

Component-wise Labour Use in Crop Cultivation

Over the study period, on an average farm the use of family, attached and casual labour in crop cultivation declined by 33.56 per cent (463 man hours), 45.82 per cent (274 man hours) and 20.90 per cent (239 man hours) respectively (Table 3).

During 2004-05, the average labour employment in crop production on overall farm households (3124 man hours/household) comprised of 44.21percent, 19.14 percent and 36.65 per cent of family labour, attached labour and casual labour, respectively. During 2018-19, the share of these components in total labour use (2147 man hours/household) changed to 42.74 percent, 15.09 perecnt and 42.17 per cent,

Table 2. Component-wise human labour use on different size categories of farms, Punjab, 2004-05 and 2018-19
(Man hours/household)

Components of labour	Year	Farm size categories			
		Small	Medium	Large	Overall
Family labour	2004-05	2851.74 (80.12)	3722.41 (59.37)	4034.47 (43.48)	3437.61 (59.29)
	2018-19	1726.04 (83.53)	2286.77 (57.72)	2461.93 (37.59)	2103.18 (56.10)
	Difference	-1125.70	-1435.64	-1572.55	-1334.43
	Percent change	-39.47	-38.57	-38.98	-38.82
Attached labour	2004-05	244.41 (6.87)	1334.41 (21.28)	2860.33 (30.82)	1208.77 (20.85)
	2018-19	27.09 (1.31)	585.89 (14.79)	1780.90 (27.19)	611.19 (16.30)
	Difference	-217.32	-748.52	-1079.43	-597.57
	Percent change	-88.92	-56.09	-37.74	-49.44
Casual labour	2004-05	463.38 (13.02)	1212.92 (19.35)	2384.78 (25.70)	1151.45 (19.86)
	2018-19	313.35 (15.16)	1089.26 (27.49)	2307.19 (35.22)	1034.31 (27.59)
	Difference	-150.03	-123.65	-77.60	-117.13
	Percent change	-32.38	-10.19	-3.25	-10.17
Total labour	2004-05	3559.52 (100.00)	6269.73 (100.00)	9279.59 (100.00)	5797.82 (100.00)
	2018-19	2066.48 (100.00)	3961.93 (100.00)	6550.01 (100.00)	3748.69 (100.00)
	Difference	-1493.05	-2307.81	-2729.58	-2049.14
	Percent change	-41.95	-36.81	-29.41	-35.34

Figures in parentheses are percentage to total labour use

respectively. Thus, overtime the proportionate use of family labour and attached labour in crop cultivation declined while the share of casual labour increased during this period.

In 2004-05, the per household labour utilization in cultivation of crops on small, medium and large size categories was 1536, 3375 and 5754 man hours, respectively which decreased to 876, 2294 and 4291 man hours respectively during 2018-19. In percentage terms the decline in labour utilization was the highest in case of small farms (42.98%) followed by medium farms (32.04%) and large farms (25.42%). Overtime, the proportionate use of family labour in total labour employed in the crop cultivation increased on the small farms (63.63 per cent to 67.85 per cent) whereas share of this component declined on medium and large farms. The share of attached labour in the total labour employment decreased on all the farm-size categories in the study period. The share of casual labour in total labour rose for all farm size-categories.

Labour Use in Livestock Enterprise

The livestock enterprise is the second major occupation of farm households after crop cultivation and provides supplementary employment opportunities to farm households. As almost all the operations in livestock are done manually so human labour employment is one of the important aspect of livestock enterprise in Punjab. This section covers the component-wise, operation-wise and gender-wise human labour employment in livestock enterprise during both the study years i.e. 2004-05 and 2018-19.

Component-wise Labour Use in Livestock Enterprise

The extent of labour employed in livestock related activities, the second major component of farming and overtime changes in this has been explored and discussed in this section. The components of human labour employment in livestock enterprise on various farm size categories has been presented in Table 4 and it was found that the total

Table 3. Component-wise human labour utilization in cultivation of crops, Punjab, 2004-05 and 2018-19

(Man hours/household)

Components of labour	Year	Farm size categories			
		Small	Medium	Large	Overall
Family labour	2004-05	977.69 (63.63)	1531.29 (45.37)	1881.42 (32.70)	1381.06 (44.21)
	2018-19	594.47 (67.85)	1022.64 (44.58)	1328.62 (30.96)	917.60 (42.74)
	Difference	-383.21	-508.66	-552.80	-463.46
	Percent change	-39.20	-33.22	-29.38	-33.56
Attached labour	2004-05	97.80 (6.37)	636.67 (18.86)	1505.63 (26.17)	597.86 (19.14)
	2018-19	2.48 (0.28)	316.88 (13.81)	954.07 (22.23)	323.94 (15.09)
	Difference	-95.32	-319.79	-551.56	-273.92
	Percent change	-97.47	-50.23	-36.63	-45.82
Casual labour	2004-05	461.00 (30.00)	1207.47 (35.77)	2366.55 (41.13)	1144.63 (36.65)
	2018-19	279.16 (31.86)	954.59 (41.61)	2008.25 (46.80)	905.42 (42.17)
	Difference	-181.84	-252.88	-358.29	-239.20
	Percent change	-39.45	-20.94	-15.14	-20.90
Total labour	2004-05	1536.48 (100.00)	3375.44 (100.00)	5753.60 (100.00)	3123.55 (100.00)
	2018-19	876.11 (100.00)	2294.11 (100.00)	4290.94 (100.00)	2146.97 (100.00)
	Difference	-660.37	-1081.32	-1462.66	-976.58
	Percent change	-42.98	-32.04	-25.42	-31.27

Figures in parentheses are percentage to total labour use

human labour employment on average household in livestock enterprises was 2137 manhours per household during 2004-05 which fell by about 40 per cent to 1281 manhours per household during 2018-19. Further, during both of the study years the total labour employed in livestock was contributed by only family and permanently attached labour components with no casualization. Family labour contributed nearly 75 per cent of total labour use in livestock related activities during 2004-05 and its share further increased to about 79 per cent during 2018-19. On the other hand, during this period, the share of permanently attached labour use decreased from about 25 per cent to 21 per cent.

The farm category-wise use of labour in livestock revealed a positive relationship with the farm size. During 2004-05, the use of human labour in livestock enterprises on small, medium and large category of farms was 1629, 2314 and 2794 manhours per farm respectively. Over time, in 2018-19, the labour use in livestock related activities declined by 36.62 percent, 42.25 percent and 40.92 per cent to 1032, 1336 and 1651 man hours on small, medium and large farms respectively.

The component wise analysis revealed that small farms relied extensively on the family labour and this component accounted for about 92 per cent of total labour use in livestock enterprise in 2004-05 and its share further rose to about 98 per cent in 2018-19. Similarly, on medium size farms, the contribution of family labour in total labour used in livestock enterprise increased from about 73 per cent in 2004-05 to about 81 per cent in 2018-19. Contrarily, on the large size farms the share of family labour in total labour employed in livestock was the lowest amongst three farm size categories and it declined overtime from about 57 per cent to 53 per cent. The per cent contribution of permanent attached labour in livestock enterprise revealed a positive relationship with the farm size. Over time, the share of permanent labour in total labour used in livestock enterprise decreased on small and medium size farms, but it increased on the large size farms.

Table 4. Component-wise total human labour employment in livestock enterprise, Punjab, 2004-05 and 2018-19

(Man hours/household)

Components of labour	Year	Farm size categories			
		Small	Medium	Large	Overall
Family labour	2004-05	1494.50 (91.75)	1689.47 (73.02)	1597.78 (57.19)	1592.83 (74.52)
	2018-19	1007.85 (97.62)	1076.38 (80.57)	871.89 (52.82)	1007.84 (78.65)
	Difference	-486.65	-613.09	-725.89	-584.99
	Percent change	-32.56	-36.29	-45.43	-36.73
Attached labour	2004-05	134.40 (8.25)	622.06 (26.89)	1196.05 (42.81)	543.74 (25.44)
	2018-19	24.61 (2.38)	259.64 (19.43)	778.77 (47.18)	273.65 (21.35)
	Difference	-109.78	-362.42	-417.28	-270.09
	Percent change	-81.68	-58.26	-34.89	-49.67
Casual labour	2004-05	-	2.04 (0.09)	-	0.81 (0.04)
	2018-19	-	-	-	-
	Difference	-	-2.04	-	-0.81
	Percent change	-	-100	-	-100
Total labour	2004-05	1628.90 (100.00)	2313.57 (100.00)	2793.83 (100.00)	2137.38 (100.00)
	2018-19	1032.46 (100.00)	1336.02 (100.00)	1650.66 (100.00)	1281.49 (100.00)
	Difference	-596.43	-977.55	-1143.17	-855.89
	Percent change	-36.62	-42.25	-40.92	-40.04

Figures in parentheses are percentage to total labour use

Factors Effecting Employment on Farm Households

In this section, the functional analysis was carried out to find out the impact of different variables on labour employment on farm households during 2004-05 and 2018-19. An attempt has been made to establish the relationship between labour employment and important factors. The magnitude of coefficient of multiple determination (R^2) indicated that the included explanatory variables collectively explained about 88 and 89 per cent variations in human labour demand of farm households in 2004-05 and 2018-19 respectively (Table 5).

The coefficient of human labour employment with respect to size of operational holding and number of livestock were found to be positively significant at one percent level of significance during both the study periods. This indicated that with the increase in these variables the human labour absorption would also increase. Mehta *et al* (2022) also observed that the labour employment increase with the increase in farm size. The coefficient of tractor use was also found to be having positive association with human labour use in both the study years at one percent level of significance. The magnitude of coefficients was 0.079 and 0.074 during 2004-05 and 2018-19 respectively. This indicated that with one percent increase in tractor use the use of human labour per household went up by 0.079 and 0.074 for 2004-05 and 2018-19 respectively. Rao (1972) also observed that tractorization raise the overall employment in agriculture sector. The coefficient of Simpson's Index, a measure of diversification of crops was found to be positively significant at one per cent level in both the study years. The magnitude of this coefficient was 0.644 and 0.158 for 2004-05 and 2018-19 respectively. The variable cost of crop production was found to be non-significant for 2004-05 which indicated that it was not an important factor in determining the human labour employment as it showed non-significant effect during 2004-05. During 2018-19, variable cost was found to have significant effect with positive sign at one per cent level of significance.

Table 5. Determinants of human labour employment on farm households, Punjab 2004-05 and 2018-19

Variables	2004-05		2018-19	
	Coefficients	Standard error	Coefficients	Standard error
Intercept	0.987^{NS}	0.341	-0.020^{NS}	0.423
Age (Years)	-0.004^{NS}	0.033	-0.020^{NS}	0.050
Education (Years of schooling)	0.0001^{NS}	0.004	0.005^{NS}	0.006
Operational holding size (Ha)	0.272***	0.063	0.589***	0.017
Number of livestock	0.181***	0.024	0.098***	0.010
Variable cost (Rs/ha)	0.071^{NS}	0.050	0.338***	0.058
Income from other sources (Rs)	0.016^{NS}	0.012	0.002^{NS}	0.005
Tractor use (Hours/ha)	0.079***	0.030	0.074***	0.032
Combine harvester (Hours/ha)	-0.047***	0.007	-0.013^{NS}	0.017
Wage rate (Rs/hour)	-0.258***	0.069	-0.194*	0.100
Proportion of family members involved in agriculture	0.060**	0.024	0.011^{NS}	0.031
Cropping Intensity (%)	-0.014^{NS}	0.131	0.722***	0.138
Simpson's Index	0.644***	0.114	0.158***	0.042
Dummy for Zone I	-0.001^{NS}	0.017	0.009^{NS}	0.016
Dummy for Zone III	0.006^{NS}	0.013	-0.048***	0.014
R^2	0.88		0.89	
Adjusted R^2	0.87		0.88	
Number of observations	295		294	

*Note: ***,** and * denotes significance level at 1 per cent, 5 per cent and 10 per cent respectively*
NS denotes Non-Significant

The magnitude of this coefficient (0.338) indicated that with one percent increase in variable costs of crop production there would be an increase in human labour employment by 0.338 per cent. During 2004-05, proportion of family members involved in agriculture was found to be positively significant at five percent. The magnitude of this coefficients indicated that with one percent increase in the proportion of family members involved in agriculture, the human labour employment on farm households would have increased 0.060 per cent. However, this variable did not affected the labour use of farm household during 2018-19. While cropping intensity was found to be non-significant in determining the labour employment during 2004-05, for 2018-19 it was found to be positively associated with labour use at one percent level of significance. The use of combine harvesters and wage rate are expected to have negative effect on the human labour use of farm households. While the coefficient of combine use was found to be negatively associated at one percent level of significance during 2004-05, for 2018-19, it was found to be non-significant. The magnitude of the elasticity indicated that during 2004-05 with one percent increase in combine use, human labour employment would have gone down by 0.047 per cent. Non-significance of combine harvester during later period may be on account of its wide spread use in harvesting of paddy and wheat crops on the farm households.

The coefficient of wage rate was found to be negatively significant at one percent level during 2004-05 and ten percent level for 2018-19. The magnitude of this coefficient indicated that one percent increase in wage rate would have decreased the human labour absorption by 0.258 during 2004-05 and by 0.194 per cent in 2018-19. Devi *et al* (2013) observed similar results for wage rate, tractor hours and combine harvester while studying the dynamics of labour demand and its determinants in Punjab agriculture. Age, education of head and income from other sources were observed to be non-significant in both the study years, thus indicating that these were not important factors in determining human labour employment on farm households in 2004-05 and 2018-19. The difference between human labour employment in zone I and zone III was non-significant in both the study periods. For 2004-05, the dummy variable for human labour employment in zone III with respect to zone II was non-significant while during 2018-19, the same was negative and significant at one percent level. This indicated that on account of region specific characteristics of farm households the employment

in Zone III was significantly low in comparison to zone II.

Conclusion and Policy Implications

In Punjab, the human labour use on an average farm household decreased by about 35 percent over the study period. In crop cultivation, the total labour employment per farm household decreased by 31 per cent and in livestock enterprise the total labour use decreased by about 40 per cent. The share of attached labour in total labour employment decreased across all the farm-size categories in the study period, the use of casual labour increased from 13.02 per cent to 15.16 per cent on small farms, 19.35 per cent to 27.49 per cent on medium farms and 25.70 per cent to 35.22 per cent on large farms. The proportionate use of family labour in total labour employed in the crop cultivation increased on the small farms whereas share of this component decreased on medium and large farms. The share of attached labour in the total labour employment decreased on all the farm-size categories in the study period. The share of casual labour in total labour increased for all farm size-categories. The results of production function found that during both the study years, the size of operational holding, number of livestock, tractor use and Simpson's Index were having positive and significant effect on employment in Punjab household. The use of combine harvester had negative and significant effect during 2004-05 while during 2018-19 it was non-significant. Wage rate had negative and significant effect on human labour employment during both the study years. Study indicates that potential of agriculture sector for labour absorption has been almost fully exploited. The surplus labour of rural areas need to be encouraged to shift towards alternate employment sources in other sectors of economy and making rural labour employable through enhancing their skills. Within agriculture, labour absorption significantly depends upon the level of diversification. However, for significant diversification away from existing cropping pattern, the government needs to make policies like price support for alternate crops along with development of supportive market and processing infrastructural facilities.

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