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Vol XXI  
No. 1

ISSN 0019-5014

JANUARY-  
MARCH  
1966

# INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF  
AGRICULTURAL ECONOMICS,  
BOMBAY

## LABOUR UTILIZATION PATTERNS AND EMPLOYMENT POTENTIALS OF PUNJAB FARMS : A CASE STUDY

S. S. JOHL

*Professor of Economics and Sociology*

AND

A. S. KAHLON

*Dean*

*College of Basic Sciences and Humanities  
Punjab Agricultural University, Ludhiana*

Efficient production primarily assumes a judicious balance in the supply of various farm resources. Whereas an under-supply of a resource would not permit maximization of returns, its over-supply might push its use to a point where marginal returns to the factor will fall very low and might even go down to zero or negative.

Agricultural labour, as an important input factor of agricultural production, is generally considered to be in over-supply on Indian farms. This creates an imbalance in farm resource availabilities and introduces inefficiencies in labour use, which has a depressing effect on agricultural wage rates. In the face of this general over-supply of agricultural labour, there sometimes occur acute shortages of labour in peak work periods and wage rates shoot high. In the interest of efficient utilization of farm labour contributing to the productivity in agriculture and its regular and gainful employment, it is essential to analytically examine the existing level and patterns of labour utilization and potentialities for its gainful employment on Indian farms.

This article attempts to describe the present availability and utilization of farm labour within a framework of given resources of some selected farms in the Ludhiana district of Punjab. The farm labour availability, utilization and balances are first analysed with the existing techniques of production used by the cultivators. The impact of improved techniques is also examined on labour use and employment potentials of the farms. Specifically, the study aims at providing answers to the following questions:

- (i) What is the labour availability, its utilization and its excess or shortage in peak work periods on different sized farm situations in the study area ?;
- (ii) What would be the impact of rationalisation of resource use on labour utilization within the framework of existing production techniques of the cultivators ?; and
- (iii) How would the utilization and employment potentials be affected by the introduction of improved production techniques ?<sup>1</sup>

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1. Improved production techniques considered here are of the nature of recommended inputs such as fertilizer, insect and pest controls, improved seed, enhanced irrigation facilities, etc., and not labour saving devices, such as introduction of improved implement and mechanization.

### *Methods and Material*

The study was located in one of the development blocks (Pakhawal) of the I.A.D.P., Ludhiana. It was confined to one synthetic farm situation of 14.15 acres (average of 20 modal sized operational holdings selected at random from four villages) and two actual farm situations, *i.e.*, a small farm of 9.40 acres and a large farm of 21.75 acres. Data at existing level of production techniques were obtained through group meeting with the cultivators. The input-output coefficients at improved techniques of production were developed based on the recommendations of the I.A.D.P., Ludhiana. Existing production plans of the cultivators were studied for labour utilization and normative optimum production plans were developed both at the levels of existing technology and improved technology. Labour use patterns, excess and shortage were studied for these optimum production plans of the three situations. Technique of analysis used is linear programming. The analysis has been made in respect of only three farming situations. Although one situation, *i.e.*, synthetic situation was fairly broad based to represent conditions on modal sized farms in the study area, the results would carry more of a qualitative significance than quantitative exposition.

### *Results and Discussion*

Under the conditions prevailing in the study area, peak work periods limiting agricultural production were obtained as under :

- (i) Mid-October—Mid-November : During this period labour is scarce because of harvest of *Kharif* crops and sowing of *Rabi* crops.
- (ii) Mid-November—Mid-March : During this period irrigation, hoeing, weeding, after-care operations of wheat and other *Rabi* crops are done and sugarcane is crushed.
- (iii) Mid-March—Mid-April : This is the period when preparations for harvest of wheat are made and some of the *Rabi* crops such as gram, oilseeds and barley are harvested.
- (iv) Mid-April—End April : During this period there is a heavy demand on labour for harvest of wheat.

This suggested that although labour in total, over the year might be abundant in supply, yet there are some peak work periods when labour actually is scarce relative to demand. Normal wage rates (mostly paid in kind) during these peak work periods in the area worked out as under :

- |                              |                                  |
|------------------------------|----------------------------------|
| (i) Mid-October—Mid-November | Rs. 4.00 per man-day of 8 hours. |
| (ii) Mid-November—Mid-March  | Rs. 3.50 per man-day of 8 hours. |
| (iii) Mid-March—Mid-April    | Rs. 4.50 per man-day of 8 hours. |
| (iv) Mid-April—End April     | Rs. 7.00 per man-day of 8 hours. |

For the rest of the period the wages ranged between Rs. 2.00 to Rs. 2.50 per man-day.

TABLE I—LABOUR UTILIZATION ON DIFFERENT SIZED TYPICAL FARMS IN PEAK WORK LOAD PERIODS, UNDER EXISTING PRODUCTION PLAN, LUDHIANA DISTRICT, PUNJAB

Crop Enterprises	Small Farm (9.40 acres)						Medium (Synthetic) Farm (12.76 acres)						Large Farm (21.75 acres)						
	Mid-March to mid-April		Mid-April to end-November		Mid-November to end-March		Mid-March to mid-April		Mid-April to end-November		Mid-November to end-March		Mid-March to mid-April		Mid-April to end-November		Mid-November to end-March		
	Acre-age	Employment	Acre-age	Employment	Acre-age	Employment	Acre-age	Employment	Acre-age	Employment	Acre-age	Employment	Acre-age	Employment	Acre-age	Employment	Acre-age	Employment	
1. Commercial Enterprise :																			
A. Rabi Season																			
Wheat—Fallow	4.00	0	80	96	256	0	0	0	59	68	211	0	0	0	192	144	504	0	
Wheat— <i>Khariif</i>	1.00	0	20	24	64	3.26	0	44	52	160	0	0	0	0	0	0	0	0	0
Wheat Unirrigated	0	0	0	0	0	1.68	0	25	30	30	0	0	0	0	0	0	0	0	0
Gram Irrigated	1.00	30	0	0	0	0.76	0	15	0	0	0	4.5	144	0	0	0	0	0	0
Gram Unirrigated	0	0	0	0	0	0.58	0	9	0	0	0	3.0	96	0	0	0	0	0	0
B. <i>Khariif</i> Season																			
Maize—Fallow	1.0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maize—Wheat	—	0	0	0	0	1.9	0	0	0	46	0	0	0	0	0	0	0	0	0
American Cotton	1.25	15	10	0	0	0.65	10	6	0	0	0	2	40	24	0	0	0	0	0
<i>Desi</i> Cotton	0.75	0	0	0	0	1.41	0	0	0	0	0	0.5	0	0	0	0	0	0	0
Sugarcane	0.50	22	4	5	250	0.32	14	2	6	131	1.5	72	18	48	825	0	0	0	0
Groundnut Irrigated	1.0	0	0	48	0	0.52	0	0	15	0	0	2.0	0	0	32	0	0	0	0
Groundnut Unirrigated	0	0	0	0	0	0.57	0	0	16	0	0	3.0	0	0	48	0	0	0	0
Fodder for Farm Animals	1.5	24	16	16	144	2.07	36	24	24	200	4.00	60	50	300	0	0	0	0	0
<i>Khariif</i>	1.0	140	74	207	780	1.46	180	98	240	840	3.00	210	120	270	930	0	0	0	0
<i>Rabi</i>	1.0	140	74	207	780	1.46	180	98	240	840	3.00	210	120	270	930	0	0	0	0
3. Tending of Farm Animals and other miscellaneous farm jobs	13.00	231	204	404	1494	18.43	240	282	497	1572	31.50	622	404	608	2559	19.30	81.24	19.74	12.83
Total	17.77	17.77	15.69	31.08	114.92	13.02	13.02	15.19	26.97	85.29	19.74	19.74	12.83	12.83	19.30	81.24	19.30	12.83	12.83
4. Labour Utilized																			
Total	410	410	240	424	1195	664	664	356	708	2657	481	481	240	474	1488	15.05	47.24	15.27	7.62
Per acre	31.54	31.54	18.46	32.61	91.92	35.02	35.02	19.21	38.42	144.16	39.17	39.17	24.00	37.62	116.48	15.05	47.24	15.27	7.62
5. Labour Available																			
Total	179	179	36	20	299	424	424	74	211	1085	141	141	164	134	1071	7.12	20.51	6.47	5.21
Per acre	13.77	13.77	2.77	1.53	23.00	23.00	23.00	4.02	11.45	58.87	10.00	10.00	7.71	10.00	78.71	7.12	20.51	6.47	5.21
6. Shortfall (—) or Excess (+)																			
Total	231	231	204	404	1494	240	240	282	497	1572	622	622	404	608	2559	19.30	81.24	19.74	12.83
Per acre	17.77	17.77	15.69	31.08	114.92	13.02	13.02	15.19	26.97	85.29	19.74	19.74	12.83	12.83	19.30	81.24	19.30	12.83	12.83



Overall utilization of labour for different peak periods under the existing production plans of the cultivators was obtained as in Table I. The table showed that in general the farm labour supply was in excess on modal sized operational holdings during all the four periods. Small sized holdings also did not experience any shortage except in November-March period. But, large sized holdings experienced shortage of labour in all the four periods. This indicated that the existing production organizations of the small and medium sized farms did not permit hiring in of additional seasonal labour even during the peak work periods. They were rather suffering from over-supply of labour resource most of the time. This surplus labour needed off the farm employment, which would add to the farm family income.

The situation brought out serious imbalances in labour employment on the farms in the study area. Whereas some farms (small and medium) suffered from over-supply of labour, thereby creating conditions of under-or disguised employment even in peak work periods, large farms suffered a shortage of labour in these periods. This shows, if surplus labour of small and medium farms gets employment on large farms, this would correct the imbalances to a considerable extent. But, due to immobility of family and permanent farm labour, the adjustments in labour supply between surplus and deficit farms do not take place. This situation sustains the casual labour force in the villages. However, the casual labour force also suffers acute under-employment, especially in slack season. Due to the availability of the casual labour in the villages, oftentimes, the small and even medium sized farms, use less of the family labour and employ the casual labour in peak periods, especially for odd and difficult jobs such as harvest of wheat and crushing of sugarcane. This explains for the high wage rates during some of the peak work periods.

Rationalisation of resource use which would maximize the returns to fixed farm resources with the existing techniques of the cultivator gave labour use pattern as in Table II. Labour was better utilized in the situation, but even at this normative optimum, medium farm and small farm had surplus labour supply and only large farm indicated shortage in all the four periods. Overall labour surpluses in all the situations rather increased as is shown in Table III.

TABLE III—PERMANENT LABOUR BALANCES IN EXISTING PRODUCTION PLANS AND OPTIMUM PRODUCTION PLANS WITH EXISTING PRODUCTION TECHNIQUES OF THE CULTIVATOR

Peak Work Periods	Balance of Man-hours						Overall Balance	
	Small farm		Medium farm		Large farm		Far-mer's plan	Opti-mum plan
	Far-mer's plan	Opti-mum plan	Far-mer's plan	Opti-mum plan	Far-mer's plan	Opti-mum plan		
Mid-March—Mid-April	179	186	424	319	—141	— 77	462 (29.71%)	428 (27.52%)
Mid-April—End April	36	40	74	130	—164	—104	—54 (—6.47%)	66 (7.91%)
Mid-October—Mid-November	20	—32	211	225	—134	—105	97 (6.04%)	88 (5.48%)
Mid-November—Mid-March	—299	—397	1085	888	—1071	—199	—285 (—5.00%)	292 (5.47%)

TABLE IV—LABOUR UTILIZATION ON DIFFERENT SIZED TYPICAL FARMS DURING PEAK WORK LOAD PERIOD, IMPROVED TECHNIQUES OF CULTIVATION, LUDHIANA DISTRICT, PUNJAB (in man-hours)

Crop Enterprises	Small Farm (9.40 acres)						Medium (Synthetic) Farm (12.70 acres)						Large Farm (21.75 acres)					
	Mid- March to mid- April	Mid- April to end April	Mid- October to November	Mid- November to March	Mid- October to November	Mid- November to March	Mid- March to April	Mid- April to end April	Mid- October to November	Mid- November to March	Mid- March to April	Mid- April to end April	Mid- October to November	Mid- November to March	Mid- March to April	Mid- April to end April	Mid- October to November	Mid- November to March
Commercial Crops																		
Wheat after Fallow	0.83	0	17	20	53	0.66	0	12	14	60	2.84	0	91	45	203			
Wheat after <i>Kharif</i>	3.26	0	65	78	209	3.09	0	56	65	278	7.84	0	251	125	565			
Wheat Unirrigated—Fallow	—	0	0	0	0	—	0	0	0	0	—	0	0	0	0			
Wheat Unirrigated— <i>Kharif</i>	—	0	0	0	0	0.81	0	13	15	20	1.50	0	36	24	64			
Gram Irrigated	—	0	0	0	0	—	0	0	0	0	—	0	0	0	0			
Gram Unirrigated	—	0	0	0	0	—	0	0	0	0	—	0	0	0	0			
Berseem (commercial)	1.69	61	41	41	1.83	0.87	31	21	21	94	3.34	1.20	80	53	361			
<i>Senji</i> (commercial)	0.44	0	0	11	21	0.83	0	0	10	40	0.16	0	0	4	8			
<i>Kharif</i> Season																		
Maize after Berseem	1.69	0	0	41	0	0.87	0	0	21	0	3.34	0	0	27	0			
Maize after Wheat	0.63	0	0	15	0	9.66	0	0	16	0	2.84	0	0	21	0			
American Cotton—Fallow	—	0	0	0	0	—	0	0	0	0	—	0	0	0	0			
American Cotton—Wheat	2.13	0	0	0	0	1.70	0	0	0	0	3.5	0	0	0	0			
<i>Desi</i> Cotton	—	0	0	0	0	—	0	0	0	0	—	0	0	0	0			
Sugarcane	1.33	48	11	32	665	2.49	110	22	45	1140	0.48	22	6	46	180			
Groundnut Irrigated—Fallow	1.13	0	0	54	0	0.73	0	0	23	0	1.5	0	0	36	0			
Groundnut Irrigated—Wheat	1.13	0	0	54	0	0.73	0	0	23	0	1.5	0	0	36	0			
Groundnut Unirrigated—Fallow	—	0	0	0	0	0.81	0	0	26	0	1.5	0	0	36	0			
Groundnut Unirrigated—Wheat	—	0	0	0	0	0.81	0	0	26	0	1.5	0	0	36	0			
Fodder for Farm Animals																		
<i>Rabi</i>	0.75	24	16	16	144	1.03	36	24	24	200	2.00	60	50	50	300			
<i>Kharif</i>	1.25	—	—	—	—	1.82	—	—	—	—	3.00	—	—	—	—	—	—	
Tending of Cattle and other miscellaneous jobs	140	74	207	780	180	180	98	840	210	120	270	930						
Labour Utilized																		
Total	16.26	273	224	569	2055	17.91	357	246	569	2672	36.84	413	634	809	2611			
Per acre	16.79	13.78	34.99	126.38														
Labour Available																		
Total	410	240	424	1195	664	354	708	2657	481	240	474	1488						
Per acre	25.21	14.76	26.08	73.49														
Shortage (—) or Excess (+)																		
Total	137	16	—145	—860	307	108	139	—15	68	—394	—335	—1123						
Per acre	8.42	0.98	—8.91	—52.89	17.14	6.03	7.76	—0.84	1.85	—10.69	—9.09	—30.48						



This indicated that in the existing production plans of the cultivator, more labour intensive enterprises were included than what was economically justified.

This means, rationalisation of resource use would further release labour, which would require gainful employment outside the farm industry.

The opportunity for creating employment potential was then examined in the adoption of improved technology. The labour use patterns of the same farms, when normative optimum production plans were developed with recommended improved techniques of production of I.A.D.P., Ludhiana, were obtained as in Table IV. Here, on medium (model) sized holdings, although the employment potential increased, yet no serious shortage was felt. But, labour shortage occurred in two peak work periods on small farm and the deficit increased on large farm. It was apparent that large farms had to be mechanized to solve the problem of labour shortage at peak periods. This would also help increase the production potential in their farm organization.

The overall impact of improved technology on employment potential is summed up in Table V. The table shows that except in the period of Mid-March—Mid-April, the improved technology increased the overall employment potential and also on almost all categories of farms. Increase in employment potential was quite substantial and suggested that as the improved techniques of production are adopted by the cultivator more and more employment would be created.

TABLE V—IMPACT OF IMPROVED TECHNOLOGY ON EMPLOYMENT POTENTIAL OF DIFFERENT SIZED HOLDINGS

Peak Work Periods	Percentage Increase (+) or Decrease (—) in Employment							
	Over farmer's plans				Over optimum plans with existing techniques			
	Small farm	Medium farm	Large farm	Overall	Small farm	Medium farm	Large farm	Overall
Mid-March—Mid-April	18.18	48.75	—33.60	—4.57	21.88	3.48	—25.99	—7.45
Mid-April—End April	9.80	—12.77	56.93	24.04	12.00	9.82	84.30	43.75
Mid-October—Mid-November	40.84	14.49	33.06	29.03	24.78	17.81	39.72	28.26
Mid-November—Mid-March	37.55	69.97	2.03	30.45	29.08	51.05	54.77	45.36

The analysis in a nutshell indicated that there existed serious imbalances in agricultural labour supply and its use on the farms in the study area. These imbalances are likely to increase if resource use is rationalised through judicious farm management decision at the existing level of production technology. But, improved techniques of production accompanied by rational farm management decisions would improve labour utilization and generate more gainful employment potential, so badly desired at this stage of economic development.